

NIGERIA

COLONY AND SOUTHERN PROVINCES.

ANNUAL

MEDICAL AND SANITARY
REPORT

FOR THE

YEAR ENDING 31ST DECEMBER, 1917.

Annual Medical and Sanitary Report, for the Colony
and Southern Provinces, for the year ending
31st December, 1917.

I. ADMINISTRATIVE.

STAFF.

Medical Staff.

EUROPEAN.

- 1 Principal Medical Officer.
- 2 Deputy Principal Medical Officers.
- 2 Provincial Medical Officers.
- 7 Senior Medical Officers.
- 58 Medical Officers.

Promotion—

- 1 Medical Officer, H. R. Ellis, to the Northern Provinces on promotion to be Senior Medical Officer.

Transfers—

- 2 Medical Officers, W. A. Nicholson and E. J. Powell, to the Northern Provinces.
- 1 Medical Officer, K. Manson, to the Gold Coast.

Invalided—Nil.

Deaths—Nil.

Retirements—R. W. Gray, Senior Medical Officer, on pension.

Appointments—Nil.

NATIVE.

- 5 Medical Officers.

Sanitary Staff.

EUROPEAN.

- 1 Senior Sanitary Officer.
- 3 Sanitary Officers.
- 4 „ Inspectors.

Promotions—Nil.

Transfers—Nil.

Termination of Appointment—Nil.

Appointments—

2 Sanitary Inspectors:—

- Mr. H. E. Wills.
- „ W. G. Joels.

NATIVE.

1 1st Class Clerk.
 1 Registrar of Vital Statistics.
 2 2nd Class Clerks.
 2 3rd „ Clerks.
 1 Deputy Registrar of Vital Statistics.
 68 Sanitary Inspectors.

Resignations—

3 Sanitary Inspectors.

Dismissals—

6 Sanitary Inspectors.

Termination of Appointments—

1 2nd Class Clerk.
 2 Sanitary Inspectors.

Transfer—

1 3rd Class Clerk.

Appointments—

1 2nd Class Clerk.
 1 3rd Class Clerk.
 16 Sanitary Inspectors.

Nursing Staff.

EUROPEAN.

6 Senior Nursing Sisters.
 9 Nursing Sisters.

New Appointments—

1 Nursing Sister.

Appointments terminated—

1 Nursing Sister.

Seconded to East Africa—

2 Nursing Sisters.

Invalided—

1 Nursing Sister.

Died—

1 Nursing Sister (drowned in S.S. "Abosso "while proceeding on leave).

NATIVE.

6 Dressers.
 26 1st Class Nurses.
 36 2nd Class „
 23 Nurses-in-training.

New Appointments—

7 Nurses-in-training.

Re-engagement—

1 2nd Class Nurse.

Promotions—

1 2nd Class Nurse to be 1st Class Nurse.
 7 Nurses-in-training to be 2nd Class Nurses.

Termination of Appointment—

1 2nd Class Nurse.

Resignation—

1 2nd Class Nurse.

Transfer—

1 1st Class Nurse to Gold Coast.

Deaths—

2 1st Class Nurses.

Storekeeping and Dispensing Staff.

EUROPEAN.

1 Medical Storekeeper.

Invalided—

1 Medical Storekeeper.

Appointments and Promotions—Nil.

NATIVE.

1 Storekeeper and Warden, Lagos Hospital.

3 Storekeepers.

1 Chief Dispenser.

1 Senior Dispenser.

10 1st Class Dispensers.

41 2nd Class Dispensers.

11 Dispensers-in-training.

New Appointments—Nil.

Promotions—

1 2nd Class Dispenser to be 1st Class Dispenser.

Clerical Staff.

EUROPEAN.

Nil.

NATIVE.

1 Senior 1st Class Clerk.

3 1st Class Clerks.

10 2nd Class „

18 3rd „ „

New Appointments—

5 3rd Class Clerks.

Promotions—

1 3rd Class Clerk to be 2nd Class Clerk.

Transfers—

1 3rd Class Clerk transferred from Public Works Department
on promotion as 2nd Class Clerk.

Resignations—

1 2nd Class Clerk.

1 3rd Class Clerk.

Dismissal—

1 2nd Class Clerk.

Termination of Appointment—

1 3rd Class Clerk.

FINANCIAL.

Statement of Revenue and Expenditure for the year 1917.

	£	s.	d.
Total Revenue	2,335	8	8
Total Expenditure:—	£	s.	d.
a. Personal Emoluments	57,828	9	4
b. Other Charges	21,518	6	1
Total	£79,346	15	5

II.—PUBLIC HEALTH.

(a).—GENERAL REMARKS.

The general health as shown by the returns compares rather unfavourably with last year. 132,878 cases were treated, of which 903 died or a case mortality of 6·8 per 1,000, as compared with 122,247 cases and 737 deaths in 1916 or a case mortality of 6·03 per 1,000. There were 10,631 more cases reported than last year. This fact however can hardly be taken as an indication of an increase in the sick rate among natives but rather as an indication, which has been noted annually in the past, of a greater inclination on the part of the native to avail himself of European methods of treatment. It is interesting to note this large increase in spite of the depletion of the Medical staff last year.

(1).—GENERAL DISEASES.

With the exception of Anæmia are not frequently seen. 2 cases of Diabetes, 7 of Gout, 12 of Exophthalmic Goitre, 2 of Leucocythæmia and 3 of Lymphadenoma. There were 12 deaths, 11 of which were due to Anæmia and one to Leucocythæmia.

(2).—COMMUNICABLE DISEASES.

(a).—*Insect-borne.*

Malaria as usual heads the list with 11,804 cases. There were 22 cases of Blackwater Fever in Europeans with 11 deaths as against 19 with 4 deaths in 1916 and 11 in 1915 with 2 deaths. Five cases occurred in natives with 2 deaths.

There were 6 cases of Trypanosomiasis, 2 of which were in Europeans. No deaths were recorded.

4 cases of Yellow Fever occurred, of which 2 were in Europeans. One death occurred from this disease in a native and one in an European.

Infectious and Epidemic.

There occurred 2,695 cases of Chicken-pox and 231 of Small-pox.

There were severe epidemics of Small-pox in the Agbor Ishan district where the disease is endemic. 12 cases of Enteric were reported. 3 of which were in Europeans. 3 natives died of this disease.

The incidence of Dysentery and the case mortality were approximately the same as last year.

Helminthic.

The figures under this head are much as in other years. Practically all natives harbour one or more intestinal parasites.

(b).—EUROPEAN OFFICIALS.*

Total number on Sick List	...	...	...	971
Total number of days on Sick List	...	...	...	5,859
Total number Invalided	...	...	...	40
Total Deaths	...	...	...	15

* See page 55 for Statistics for whole of Nigeria.

TABLE SHOWING THE CAUSES OF INVALIDING AND DEATHS.

Cause.										Invalided.	Died.
Dysentery	...	...	...	...	...	...	...	...	...	1	...
Enteric ...	...	...	...	...	...	...	...	...	...	1	...
Malaria	...	...	...	...	...	...	...	...	...	2	1
Blackwater Fever	...	...	...	...	...	...	...	...	...	4	5
Acute Rheumatism	...	...	...	...	...	...	...	...	...	1	...
Tuberculosis	...	...	...	...	...	...	...	...	...	1	1
Syphilis ...	...	...	...	...	...	...	...	...	...	1	...
Trypanosomiasis	...	...	...	...	...	...	...	...	...	1	...
Yellow Fever	...	...	...	...	...	...	...	...	...	...	1
Alcoholism	...	...	...	...	...	...	...	...	...	1	1
Anæmia	...	...	...	...	...	...	...	...	...	5	...
Insomnia	...	...	...	...	...	...	...	...	...	1	...
Neurasthenia	...	...	...	...	...	...	...	...	...	1	...
Mental Disease	...	...	...	...	...	...	...	...	...	4	1
Aneurism Acuta	...	...	...	...	...	...	...	...	...	1	1
Pleurisy	...	...	...	...	...	...	...	...	...	1	...
Glossitis	...	...	...	...	...	...	...	...	...	1	...
Gastritis	...	...	...	...	...	...	...	...	...	2	...
Ulcer of Stomach	...	...	...	...	...	...	...	...	...	1	...
Gastro-duodenal Ulcer	...	...	...	...	...	...	...	...	...	2	...
Fistula in Ano...	...	...	...	...	...	...	...	...	...	1	...
Appendicitis	...	...	...	...	...	...	...	...	...	1	...
Abscess of Liver	...	...	...	...	...	...	...	...	...	1	...
Jaundice	...	...	...	...	...	...	...	...	...	1	...
Acute Nephritis	...	...	...	...	...	...	...	...	...	...	1
Bright's Disease	...	...	...	...	...	...	...	...	...	...	1
Boils	...	...	...	...	...	...	...	...	...	1	...
Injuries General	...	...	...	...	...	...	...	...	...	...	2
Tumours Mal	...	...	...	...	...	...	...	...	...	1	...
General Debility	...	...	...	...	...	...	...	...	...	2	...
Total										10	15

(c).—NATIVE OFFICIALS.

Total number on Sick List	...	...	...	...	1,642
Total number of days on Sick List	...	...	...	...	10,373
Total number Invalided	...	...	...	...	17
Total Deaths	...	...	...	...	6

INVALIDING AND DEATHS.

NATIVE OFFICIALS.

Cause.										Invalided.	Died.
Pneumonia	...	...	...	...	...	...	...	...	...	...	1
Tetanus	...	...	...	...	...	...	...	...	...	...	1
Tuberculosis	...	...	...	...	...	...	...	...	...	6	...
Neuritis	...	...	...	...	...	...	...	...	...	1	...
Apoplexy	...	...	...	...	...	...	...	...	...	2	...
Mental ...	...	...	...	...	...	...	...	...	...	1	...
Neurasthenia	...	...	...	...	...	...	...	...	...	1	...
Valvular Disease of Heart	...	...	...	...	...	...	...	...	...	6	...
Pleurisy	...	...	...	...	...	...	...	...	...	...	1
Peritonitis	...	...	...	...	...	...	...	...	...	...	1
Nephritis	...	...	...	...	...	...	...	...	...	...	1
Stricture	...	...	...	...	...	...	...	...	...	...	1
Total										17	6

(d).—SOLDIERS.

Average strength	...	...	...	...	1,102
Average sick rate per 1,000	...	...	...	...	380.30
Average death rate per 1,000	...	...	...	...	9.18

(e)—POLICE.

Average strength	...	...	...	1,440
Average sick rate per 1,000	...	...	...	84.17
Average death rate per 1,000	...	...	...	6.6

(f)—PRISONERS.

Total number of prisoners passed through the Registers	...	...	...	37,043
Daily average number of prisoners	...	...	...	7,060
Sick rate per 1,000 (daily average)	...	...	...	2.63
Death rate per 1,000	...	...	...	12.2

(g)—NON-OFFICIAL EUROPEAN POPULATION.

Figures under this head are unreliable. The following are the most accurate obtainable:—

Estimated population	...	...	...	1,650
Total number on Sick List	...	...	...	301
Total number of days on Sick List	...	...	...	2,231
Total number Invalided	...	...	...	—
Total number of Deaths	...	...	...	—

INVALIDING AND DEATHS.

NON-OFFICIALS EUROPEAN.

Cause.									Invalided.	Died.
Neurasthenia	...	...	...	...	...	...	...	...	4	...
Malaria	...	...	...	...	...	...	...	...	1	...
Blackwater Fever	...	...	...	...	...	...	...	...	5	...
Diabetes	...	...	...	...	...	...	...	...	1	...
Gonorrhoea	...	...	...	...	...	...	...	...	1	...
Dysentery	...	...	...	...	...	...	...	...	2	...
Alcoholism	...	...	...	...	...	...	...	...	1	...
Rheumatism	...	...	...	...	...	...	...	...	1	...
Phthisis	...	...	...	...	...	...	...	...	2	...
Trypanosomiasis	...	...	...	...	...	...	...	...	1	...
Anæmia	...	...	...	...	...	...	...	...	1	...
Tuberculosis	...	...	...	...	...	...	...	...	1	...
Epilepsy	...	...	...	...	...	...	...	...	1	...
Colitis	...	...	...	...	...	...	...	...	1	...
Aestivo-Autumnal	...	...	...	...	...	...	...	...	...	1
Blackwater Fever	...	...	...	...	...	...	...	...	...	6
Tuberculosis	...	...	...	...	...	...	...	...	...	1
Alcoholism	...	...	...	...	...	...	...	...	...	1
Enteric	...	...	...	...	...	...	...	...	...	1
Valvular Disease of Heart	...	...	...	...	...	...	...	...	...	1
Arterio-sclerosis	...	...	...	...	...	...	...	...	...	1
Total									23	12

(h)—NON-OFFICIAL NATIVE POPULATION
VITAL STATISTICS.

The total estimated population of the Colony and Southern Provinces is based on the census of 1911 and is as follows:—

Africans	...	...	...	7,856,000
East Indians	...	...	...	99
Mixed and Coloured	...	...	...	487
Total	...	...	...	<u>7,856,586</u>

Registration is compulsory in Lagos and Ebute Metta only. The statistics from these places are as follows :—

Total Births	...	...	...	...	2,846 *
Total Deaths	...	...	...	..	2,167 *
Total Deaths of Infants under one year					795 *
Total Still births	...	...	...	...	141
Infant Mortality per 1,000 Births	...				279·3

* Exclusive of 141 Still births.

III.—SANITATION.

(A).—GENERAL REVIEW OF WORK DONE, LAWS PASSED AND PROGRESS MADE.

(I).—ADMINISTRATIVE.

The Sanitary work of the year under review forms the work carried out during the first complete year of tenure of office of the present Senior Sanitary Officer.

2. The continuation of the War maintained the prevailing conditions adverse to Sanitary progress. Staff and money are the two main sources of energy. With shortage in both these we have at the present phase reluctantly to content ourselves to conserving our energies for maintaining the general sanitary condition by steady routine work and for meeting emergencies that arise in the way of epidemics or investigations of special nature.

3. While the number of our Medical Officers on the Staff list has remained constant during 1917 the urgency of the War has compelled us to permit more of them to take up active service as compared with the number seconded in 1916.

4. *Work done by Sanitary Officers.*—During the year under review the Senior Sanitary Officer and one Sanitary Officer were on leave during which period the general work of the Sanitary Department devolved on one Sanitary Officer while the time of the third Sanitary Officer of the Staff was devoted to the carrying out of the duties of Medical Officer of Health under the Town Council of Lagos.

5. Dr. Dalziel has with great interest and efficiency carried out this work of Medical Officer of Health during the whole of the year.

The Senior Sanitary Officer and the two Sanitary Officers have devoted considerable time to the conduct of routine tours of inspection.

6. With the inauguration of Townships and their segregation plans many inspections of sites have had to be carried out with a view to advising both as to the suitability of the site and as to the sanitary layout of both the Europeans and Non-Europeans Reservations. The development of the Eastern Railway has given rise to the development of stations on the line many of which will, in a very short time, occupy the status of a Township that necessitates a layout on sanitary lines with subsequent supervision so that its growth may be healthy.

7. Routine office work has, notwithstanding the War, increased very considerably and at times it is not possible for one Sanitary Officer alone to conduct all the office work up to date which does not tend to efficiency when work is behind hand.

It is almost impossible for the Officer in charge of the Sanitary branch to leave the office to proceed on a short tour if he is single handed.

The office of the Registrar of Vital Statistics forms part of the Sanitary Office. The control of its working is part of the duties of the Senior Sanitary Officer who has often to investigate matters relative to cases of Births and Deaths, having often to refer many cases of the latter to the Coroner.

Increase in the staff of Sanitary officers is however an after the War problem and one to be kept in view.

8. *Sanitary Staff*.—The European Sanitary Staff has consisted of eight Europeans: one Senior Sanitary Officer, three Sanitary Officers and four European Sanitary Inspectors. One Sanitary Officer and one European Sanitary Inspector were for the whole year seconded to the Health Department of the Lagos Town Council. A second European Sanitary Inspector has been seconded to Military service and proceeded with the Expeditionary Force to East Africa.

Two of the four European Sanitary Inspectors were appointed during the year.

The Native Staff consisted of 75 members; of these 7 form the Clerical Staff and 68 are Sanitary Inspectors.

9. *Native Sanitary Inspectors*.—Of the 68 on the staff 3 resigned; and in the case of two, their appointments were terminated. A steady weeding out of the undesirable men on the staff is taking place and the employment of a better type of men educationally and otherwise will improve the quality of the service both in efficiency and attractiveness. Sixteen new appointments were made.

10. *Clerical Staff*.—There have been several changes in the personnel of the Clerical Staff: in the case of one 2nd Class Clerk his appointment was terminated; one 3rd Class Clerk was transferred on promotion; one new 2nd Class Clerk and one new 3rd Class Clerk were appointed. Such changes in a limited Clerical Staff as that of this office place the office work at a very considerable disadvantage and do not tend to efficiency.

11. *Sanitary Inspectors-in-Training*.—Out of seven Sanitary Inspectors-in-Training, six, who had completed two years of training and passed the examination in Lagos at the end of 1916, were early in 1917 sent to outstations to complete their third year of practical training under Medical Officers. These six men have all been well reported on as regards their work and character whereby they have qualified for admission to the permanent staff of the service.

Ten new Sanitary Inspectors-in-Training were appointed in 1917, of these, one was dismissed in December.

Seven temporary Sanitary Inspectors were employed.

In order to meet the needs of the service it has been found necessary to employ a certain number of temporary Sanitary Inspectors who possess the required standard of education to enter the permanent service. After they have been subjected to a short period of practical training they are appointed to outstations. By this means we are enabled to form an opinion of these temporary men as to how they are likely to shape and it is from amongst their ranks that we draw on for promising men as Sanitary Inspectors-in-Training who undergo the training for 3 years and ultimately enter the permanent service.

12. *Regrading of Sanitary Inspectors.*—Proposals were submitted for improving the salary of the 1st or highest grade of Sanitary Inspectors. Sanction was accorded and the scale of salary for this grade will from 1st January, 1918, be £96—6—150. This improvement in emoluments of the highest grade places the service on a par with that of the first grade clerks of the clerical service; a branch of Government service which has always attracted the better educated youth. As such it offers equal inducements to candidates of a higher education and makes it possible to raise the necessary standard of education for entry as well as the standard of tuition men will have to undergo when in training. This will in every way improve the quality of men in the service and so tend to its efficiency.

13. *Sanitary Ordinances, Orders and Regulations, etc.*—The year has been one of heavy legislation for many Laws have been passed which directly or indirectly are closely concerned with sanitation and its promotion, or which influence the health of a community for its good.

ORDINANCES PASSED.

I.—THE NATIVE LIQUOR ORDINANCE, 1917.

To regulate the sale of Native Liquors.

II.—THE BUILDING LINES REGULATION ORDINANCE, 1917.

To provide for the regulation of the position of buildings with reference to roads.

This is an important Ordinance relative to sanitation more especially to Town Planning. It is one that if carefully applied to the existing towns will gradually result in the widening of narrow streets. Where its utility will be greatest will be in the development of suburban areas of the larger towns which are expanding. The application of this Ordinance in itself, although it will very materially help in Sanitary advance yet it will not bring about all the Sanitary development, that is both desirable and possible, without being supplemented by further Town Planning Regulations which should include sound Building Bye-Laws or Regulations for 2nd and 3rd Class Townships applicable:

(a) to existing conditions so as to gradually bring about their improvement.

(b) to Town extensions that are taking place, and

(c) to new Townships already laid out fully on Sanitary lines.

Repeal: The Buildings Regulation Ordinance, 1912 (No. 29 of 1912).

III.—THE SALE OF FOODS ORDINANCE, 1917.

To make provision for the sale of Food and Drink in a pure state.

Repeal: The Adulteration of Food Ordinance (Chapter 46 of the Laws of Southern Nigeria).

IV.—THE LIQUOR ORDINANCE, 1917.

To regulate the importation, manufacture, and sale of intoxicating Liquor.

Repeals: All the previous Ordinances and Proclamations relative to the importation, distillation and sale of spiritous liquors as enumerated in the second Schedule of the Ordinance.

V.—THE TOWNSHIPS ORDINANCE, 1917.

For the establishment and regulation of Townships. This useful Ordinance facilitates the application of the Public Health Ordinance and its Rules whereby sanitary control can be more definitely exercised therein.

- Repeals: 1. The provisions of the Public Health Ordinance (chapter 81 of the Laws of Southern Nigeria) (as amended by the Public Health (amendment) Ordinance of 1908 and 1910) in so far as they relate to the constitution, powers and duties of the Lagos Municipal Board of Health when Lagos was declared a Township of the first class and the Lagos Municipal Board of Health (Incorporation) Ordinance, 1909 (as amended by the Lagos Municipal Board of Health (Incorporation) (amendment) Ordinance, 1913).
2. The European Reservation Ordinance (chapter 110 of the Laws of Southern Nigeria).
3. The Towns Ordinance (chapter 82 of the Laws of Southern Nigeria).
4. The Roofing of Buildings Ordinance (chapter 86 of the Laws of Southern Nigeria), the Fire Ordinance (chapter 87 of the Laws of Southern Nigeria), the Highways Ordinance, 1911, and the Theatres and Public Performances Regulations Ordinance, 1912.

VI.—THE MARKETS ORDINANCE, 1917.

To provide for the establishment and management of markets.

Repeal: The Markets Ordinance (chapter 84 of the Laws of Southern Nigeria).

VII.—THE PUBLIC HEALTH ORDINANCE, 1917.

- Repeal: 1. The Public Health Ordinance (chapter 81 of the Laws of Southern Nigeria).
2. The Infectious Diseases Ordinance, 1908.
3. The Destruction of Mosquitoes Ordinance (Ordinance No. 16 of 1910 of Southern Nigeria).

VIII.—THE BIRTHS, DEATHS, AND BURIALS ORDINANCE, 1917.

To provide for Registration of Births and Deaths and to regulate Burials.

Repeals: The Births, Deaths and Burials Ordinance, the Births and Deaths Registration (Protectorate) Ordinance (chapters 96, 97 and 98 of the Laws of Southern Nigeria).

IX.—THE LIQUOR (AMENDMENT) ORDINANCE, 1917.

Amending section 64 of the Principal Ordinance.

X.—THE DISEASES OF ANIMALS ORDINANCE, 1917.

To make provision for preventing the introduction and spread of Infectious or Contagious Disease amongst animals.

Repeals: The prevention of Disease (Animals) Ordinance, 1908, and the Ordinances amending the same.

XI.—THE VACCINATION ORDINANCE, 1917.

To provide for Vaccination.

Repeal: The Vaccination Ordinance (chapter 80 of the Laws of Southern Nigeria).

XII.—THE PORTS ORDINANCE, 1917.

To provide for regulation of Ports in Nigeria.

Repeals: Chapters 57, 57 (a) and 62 of the Laws of Southern Nigeria and Ordinance No. 17 of 1908.

The following Orders in Council have been made:—

I.—UNDER THE BURIALS ORDINANCE, 1917, NO. 5 OF 1917.

Declaring the Christian Cemetery at Creek Town, Calabar, a public burial ground.

II.—UNDER THE TOWNSHIPS ORDINANCE, 1917, NO. 15 OF 1917.

Declaring the Township of Lagos a Township of the first class.

III.—UNDER THE NATIVE LIQUOR ORDINANCE, 1917, NO. 18 OF 1917.

Defining the areas of application of the Ordinance.

IV.—UNDER THE TOWNSHIPS ORDINANCE, 1917, NO. 19 OF 1917.

Declaring the following towns to be Townships of the second class:—

Calabar, Enugu Ngwo, Forcados, Itu, Opobo, Port Harcourt, Sapele and Warri.

Declaring the following towns to be Townships of the third class:—

Abakaliki, Afikpo, Agbo, Asaba, Bonny, Brass, Burutu, Epe, Idah, Ikom, Koko, Obudu, Ogwashi and Owerri.

V.—UNDER THE TOWNSHIPS ORDINANCE, 1917, NO. 22 OF 1917.

Making the Dogs Ordinance, 1915, applicable to the Township of Lagos.

VI.—UNDER THE DOGS ORDINANCE, 1915, NO. 24 OF 1917.

1. Applying the provisions of the Dogs Ordinance, 1915, to all Townships.
2. Revoking Order-in-Council No. 33 of 1916.

VII.—UNDER THE TOWNSHIPS ORDINANCE, 1917, NO. 25 OF 1917.

Declaring the following towns as Townships of the third class:—
Ado, Awka, Degema, Ilaro, Ogoja and Okigwi.

VIII.—UNDER THE PUBLIC HEALTH ORDINANCE, 1917, NO. 26 OF 1917.

Applying the provisions of section 17 (2) of the Public Health Ordinance to the Township of Lagos.

IX.—UNDER THE PRISONS ORDINANCE, 1916, NO. 27 OF 1917.

Declaring the prisons at the various stations to constitute Convict, Provincial and Divisional prisons.

X.—UNDER THE LIQUOR ORDINANCE, 1917, NO. 28 OF 1917.

Declaring "Prohibited Areas" in the Southern Provinces under the Ordinance.

XI.—UNDER THE PUBLIC HEALTH ORDINANCE, 1917, No. 32 OF 1917.

Applying the provisions of section 17 of the Ordinance to all Townships of the second and third Class.

XII.—UNDER THE PUBLIC HEALTH ORDINANCE, 1917, No. 33 OF 1917.

Applying the provisions of sections 19–21 of the said Ordinance to the places or areas set out in the following Schedule :—

1. All third Class Townships in the Southern Provinces.
2. All lands lying within a radius of two miles from the market in front of Deji's house at Akure.
3. All lands lying within a radius of one mile of points specified at various places not classified as second or third class Townships.

The following Regulations have been framed :—

- I.—UNDER THE PRISONS ORDINANCE, 1916, No. 2 OF 1917.
- II.—UNDER THE LUNACY ORDINANCE, 1916, No. 4 OF 1917.
- III.—UNDER THE LEPER ORDINANCE, 1916, No. 5 OF 1917.
- IV.—UNDER THE LIQUOR ORDINANCE, 1917, No. 21 OF 1917.
- V.—UNDER THE QUARANTINE ORDINANCE, 1916, No. 26 OF 1917.
- VI.—UNDER THE NATIVE LIQUOR ORDINANCE, 1917, No. 33 OF 1917.
- VII.—UNDER THE BIRTHS, DEATHS, AND BURIALS ORDINANCE, 1917, No. 41 OF 1917.
- IX.—UNDER THE LIQUOR ORDINANCE, 1917, No. 55 OF 1917.

The following Rules were passed : —

1. UNDER THE PUBLIC HEALTH ORDINANCE, 1917, RULES No. 2 OF 1917.
2. UNDER THE TOWNSHIPS ORDINANCE, 1917, RULES No. 3 OF 1917.
3. UNDER THE MARKET ORDINANCE, 1917, RULES No. 4 OF 1917.
4. UNDER THE TOWNSHIPS ORDINANCE, 1917, RULES No. 6 OF 1917.

This revokes Rule 1 of Rules No. 3 of 1917, and amends it to great advantage.

These Rules are for application in second class Townships. Rule 1 as amended is with a view to controlling the erection of new buildings by necessitating the submission of plans of the proposed building including a block plan shewing the position of other buildings and erections on the same plot and on immediately adjoining plots, for the inspection and sanction in writing by the Local Authority to erect a building of any given specifications on a particular site. It is extremely essential that guiding principles should be laid down for the use of Local Authorities to enable them to judge correctly from the sanitary point of view.

- (a) The plan of the building as regards its specifications which should include light, ventilation, sanitary arrangements, drainage, etc., for consideration.
- (b) The site as regards the building relative to other buildings on the site, existing or proposed, and relative to buildings on adjacent plots. In considering such site plans attention would be specially directed to the total area of the plot to be covered by buildings so as to provide for ample space around housing for light, ventilation and drainage and permit of access and inspection of the area behind the house.

As in 2nd class Townships so also in 3rd class Townships to ensure development on sanitary lines it is essential that all plans of new buildings should be thoroughly examined and passed by the Local Authority before erection.

As regards huts and temporary buildings in non-European reservations of both 2nd and 3rd class Townships it is essential that the proportion of the site area or plot on which building may be erected should be fixed for the guidance of Local Authorities relative disposition of huts also require to be governed on definite lines. In this way overcrowding with houses will be guarded against and light, ventilation and space for drainage will be provided for.

BYE-LAWS PASSED.

- I. Bye-Laws under the Townships Ordinance, 1917, have been made by the Town Council of the Township of Lagos.

These include Building Regulations which meet sanitary needs, so far as it is possible, of existing conditions in an old established town which can only be gradually reformed and that to a limited degree.

Sound Town Planning Regulations are needed to regulate the development of suburbs on modern sanitary lines, for growth and expansion are constantly taking place and this affords scope for the introduction of more approved sanitary conditions.

- II. Bye-Laws under the Market Ordinance, 1917, have been made by the Town Council of the Township of Lagos. These are known as the "Lagos Meat Market Bye-Laws" and they regulate the sale of meat and enforce the maintenance of the necessary cleanliness of the meat stalls.

14. *Tours of Inspection.*—Such tours were carried out by the Senior Sanitary Officer and by each of the two Sanitary Officers.

The following places were inspected:—

Forcados, Onitsha, Port Harcourt, Enugu, Afikpo, Bonny, Aba, Okigwi, Warri, Opobo, Illushi, Ikot Ekpene, Itu, Obubra, Ikom, Ogoja, Abakaliki, Uzuakoli, Umuahia, Oni, Ejirin, Epe, Idah, Burutu, Sapele, Koko, Brass, Degema, Abonema, Akassa, and Calabar.

Special visits of investigation were made by a Sanitary Officer on the occurrence of a case of Yellow Fever at Forcados and another at Bonny; also to Illushi owing to an outbreak of small-pox.

A special tour of inspection was made by the Senior Sanitary Officer with a view to investigating the head waters of the Aba river, as a source of water supply for Port Harcourt, on which a special report was rendered.

15. *Sanitation of the Railways.*—This has been carried out so far as it has been possible. The Nigerian Eastern Railway has received considerable attention during the year owing to the rapid development of some of the stations on the line where trade centres are now established.

16. *Plans.*—Segregation plans of the following stations were approved:—

Sapele, Enugu, Iseyin, Ibadan, Ado, Afikpo Road, Umuahia, and Uzuakoli.

The last three are all stations on the Eastern Railway.

17. *Reservation Boards*.—With the establishment of Townships the Reservation Boards will now cease to exist and their duties and interests together with their financial control will pass into the hands of the Local Authorities. The Medical Officer will continue in his capacity as adviser to the Local Authority in matters relative to Sanitation and Public Health.

18. *Estimates*.—The Estimates for the year for the expenditure directed by the Sanitary Office amounted to £21,234 an increase of £4,162 on those of 1916.

(II).—PREVENTIVE MEASURES.

(1). —*Mosquito and Insect-borne Diseases*.

19. *Malaria*.—In Europeans 617 cases were treated as compared with 544 in 1916 and 498 cases in 1915. This shows a steady rise in the number treated.

Of the 617 treated no less than 603 are of the Aestivo Autumnal type.

In Natives 11,187 cases were treated as compared with 8,197 in 1916 and 5,018 in 1915. This figure also shows a steady rise. Of the cases treated in 1917 10,942 are returned as of Aestivo Autumnal type.

The total cases treated for all causes in 1917 amount to 2,922 in Europeans with 23 deaths and in Natives 129,956 with 880 deaths.

The total cases of Malaria in both Europeans and natives amount to 11,804 and the total cases treated for all causes amount to 132,878. Malaria therefore forms 8·8% of the total cases that come under treatment for all causes.

20. *Routine Anti-Mosquito Work* is conducted at all stations. As stated in the annual report for 1916 many Medical Officers have now to supervise the sanitation of two or even three stations which does not advance sanitary interests by any means, knowing, as we do the necessity of having to exercise constant supervision over the subordinate staff.

Lagos.—Here anti-mosquito work has been maintained at a high degree of efficiency and notwithstanding the exceptionally heavy rain fall. The Larvae Index was 2·08—the figure being practically the same as for 1916 which speaks well for the working of the Health Department of the Town Council. Closed rooms still prove a source of mosquito breeding though not so much as in previous years. All wells are inspected periodically for larvae. Oiling, draining and filling in of low lying swamp areas is carried out. Gutters have been removed from the roofs of nearly all Government buildings and a distinct reduction in mosquitoes is perceptible. A special gang of anti-mosquito labourers is maintained to carry out the necessary measures: filling in of crab holes and dealing with trees and other sources of mosquito breeding.

21. *Borrow Pits*.—With the judicious application of the Rules under the Public Health Ordinance there will be greater facility for dealing with this source of danger to public health. Prevention of the pits is what is required. Much can be done with a view to this but constant supervision is necessary especially in new and developing Townships where personal interests are subserved regardless of these relative to the health of the community.

22. *Quinine Prophylaxis*.—Quinine as a prophylactic still holds its important position amongst the necessary measures that have to be adopted for personal prophylaxis. To depend on small doses of quinine alone to combat heavy malarial infection which is gaining access to the body constantly would be futile but its utility is great as an adjuvant to other means that are essential such as the use of the mosquito net and mosquito boots, when combined with the many other factors of personal hygiene, such as regular hours with rest, avoidance of undue overwork and strain, care in diet and exercise, etc., that all contribute so much to maintaining the general health of the individual. The accompanying table shews the amount of quinine that has been issued for prophylactic purposes.

	1910 Grains.	1911 Grains.	1912 Grains.	1913 Grains.	1914 Grains.	1915 Grains.	1916 Grains.	1917 Grains.
Western Districts	1,206,000	1,530,100	1,344,000	915,001	593,423	770,333	844,786	862,718
Central Districts	140,532	299,963	355,448	407,484	597,574	53,281	326,066	442,865
Eastern Districts	400,671	586,384	301,286	625,845	990,733	651,749	426,452	596,986
Total ..	1,747,203	2,416,447	2,000,734	1,948,330	2,165,732	1,475,363	1,597,304	1,902,569

23. *Blackwater Fever*.—In Europeans 22 cases were treated with 11 deaths, a case mortality rate of 50% as compared with 15·8% in 1916. This rise in Blackwater Fever cases is an accompaniment of the rise in the number of cases of Malaria with which its incidence is so closely related.

BLACKWATER FEVER IN EUROPEANS.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
Number of cases ...	57	48	31	34	26	23	26	20	11	19	22
Case Mortality rate per cent.	17·5	16·6	32·2	20·6	30·7	17·4	23·0	25·0	18·2	15·8	50·0%

Five cases of Blackwater Fever occurred in natives with 2 deaths.

24. *Trypanosomiasis*.—Six cases have been recorded, of these 2 were in Europeans and 4 in Natives. Of the 6 cases five occurred in the Eastern, *i.e.*, 1 European and 4 Natives, the remaining 1 European in the Western Districts. Considering the wide prevalence of *Glossina Palpalis* and other species of Tsetse fly the number of cases that come to light are very small.

25. *Yellow Fever*.—Four cases of Yellow Fever occurred in the Southern Provinces, 2 in Europeans, of which 1 proved fatal, and 2 in Natives. All necessary precautions were immediately taken to prevent spread of infection so that each case proved to be sporadic. Of the two cases in Europeans one occurred at Lagos and one was reported from Forcados.

During the year cases of Yellow Fever were reported from the Gambia, Sierra Leone, the Gold Coast and the Congo. At Accra only did two consecutive cases occur. Several cases of Yellow Fever occurred during the month of September in Districts along the Benue River in the Northern Provinces and the Benue was declared an "Infected area." All necessary inspection of ships arriving from these areas was carried out to prevent importation of infection.

26. *Filariasis*.—In Natives 70 cases of Filarial infection are recorded and 82 cases of Elephantiasis.

27. *Pappataci Fever*.—Two cases of this are recorded.

(2).—*Epidemic Diseases*.

28. *Plague*.—Two outbreaks of plague were reported from the Gold Coast one in March and the other in December, 1917, and one outbreak was reported from Senegal. Every precaution was taken to prevent introduction of the disease into this Colony, which is very fortunate to have remained free from this disease so far.

29. *Destruction of Rats and Mice*.—A routine procedure in Lagos is carried out as a preventive measure in view of the possibility of plague being introduced. When plague was reported from the Gold Coast increased efforts were put forward in this work of destruction of rats and mice as will be seen from the results given in the following table :—

	1912.	1913.	1914.	1915.	1916.	1917.
Rats	18,528	16,488	13,352	13,305	15,197	20,713
Mice	8,346	8,279	6,817	8,087	9,102	9,871
Total	26,874	24,767	20,169	21,392	24,299	30,584

30. *Small-pox*.—In Natives 231 cases are reported as treated. Extensive outbreaks took place in the Ilaro District of Abeokuta Province, where two special vaccinators were sent to help in suppressing the spread, also in Agbor Ishan Districts and Eboro District of the Benin Province. An outbreak at Illushi on the right bank of the Niger was investigated and dealt with by a Sanitary Officer towards the end of 1917.

Okpala in the Owerri Province and Gakom in the Ogoja Province also formed centres of prevalence of the disease.

In Lagos 16 cases were isolated and treated.

31. *Vaccination*.—Special vaccinations were conducted at seats of outbreak of Small-pox. As a routine procedure it is carried out systematically both in Lagos and in all outstations. The following table shews the results of the work of vaccination :—

	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
Total number vaccinated ...	135,647	166,394	243,316	168,491	149,273	101,467	136,279	152,803
Successful ...	88,579	113,657	176,944	121,102	99,260	71,716	87,963	96,675
Percentage of successes ...	65·3	68·3	72·7	71·8	66·5	70·6	64·5	63·2

32. *Chicken Pox*.—In Natives 2,695 cases were treated. The disease prevails everywhere but the infection has been great in many prisons, *e.g.*, at Ikot Ekpene, Port Harcourt, Calabar and Owerri as well as in several centres in the Niger Delta and 30 cases occurred in Lagos.

33. *Cholera and Cerebro-Spinal Fever*.—No cases recorded.

34. *Diphtheria*.—One case recorded in a native.

35. *Beri Beri*.—In natives four cases were recorded.

36. *Tetanus*.—As compared with other years comparatively few cases have been treated and the case mortality is low at 36%.

TETANUS.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
Cases ...	29	26	27	29	25	29	24	46	33	34	19
Deaths ...	10	11	15	?	16	15	12	23	12	17	7
Mortality ...	34.5%	42.3%	55.5%	?	64%	51%	50%	50%	36%	50%	36%

37. *Rabies*.—No cases were recorded.

38. *Venereal Diseases*.—The figures of cases treated for Gonorrhoea and Syphilis are much the same as those for 1916 but they form no indication as to the actual prevalence of the disease.

VENEREAL DISEASE.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
Gonorrhoea ...	1,174	1,524	1,637	1,977	1,785	1,991	1,913	1,605	1,669	2,482	2,449
Syphilis ...	224	214	176	171	269	303	202	215	266	400	371

39. *Leprosy*.—114 cases were treated as compared with 70 cases in 1916. More patients afflicted with this disease have probably sought treatment. The present time does not afford facilities for the enforcement of extensive segregation measures.

40. *Tuberculosis*.—The following figures show the number of cases recorded amongst natives during the last five years:—

1913	1914	1915	1916	1917
159	109	168	181	178

In Lagos 55 certified deaths from Tuberculosis were registered as compared with 54 in 1916. The housing conditions in many parts of Lagos doubtless aid considerably in the spread of Tuberculosis. The present time is not however one which is opportune to put forward an improvement scheme to combat the housing situation; it will however be kept in view for consideration on the return of normal times.

41. *Dysentery*.—Amongst Europeans 34 cases were treated as compared with 29 in 1916. In Natives 1,059 cases were treated with 119 deaths, giving a case mortality of 11.2% similar to that recorded for 1915 and very much lower than 20% recorded for 1916.

42. *Enteric*.—Using the term “Enteric” in a general way, as covering Typhoid, para. Typhoid A and para. Typhoid B, 15 cases were recorded in Lagos during the period 10th July to 21st November, 1917. Of the 15 cases 4 were imported into Lagos and of these 3 were cases taken off incoming ships in August and September the remaining 11 cases acquired their infection in Lagos being distributed in various localities in Lagos and Ebute-Metta. It is worthy of note that of the 15 cases 9 were cases that sought admission to the Lagos Hospital and the remaining 6 were diagnosed and notified by Dr. Gray an European Private Practitioner; no cases were notified by any of the 14 Native Medical Practitioners. In view of this and that other cases must inevitably have occurred amongst natives for no less than 396 uncertified deaths were recorded by the Registrar of Vital Statistics under the

general terms of Diarrhoea and Dysentery, it would be advisable in the interests of public health that on the occurrence of a number of cases of Enteric or any other contagious or infectious disease that private Medical Practitioners should be notified by the Sanitary Authority as to their prevalence so as to put them on the alert with a view to diagnosing any dubious cases that come under their care. The disease is a water-borne disease and every effort was made to trace the source of infection to the various sources of water supply in Lagos; 50 samples of water taken from the following sources were examined:—

Native wells in the town	6
House Tanks	2
Stand Pipes and taps of the Public service	40
House hold filter	1
Soda water from the Railway factory ...	1
	<hr/>
	50
	<hr/>

Bacteriological examination for Typhoid Bacilli was made in each case but with negative results. Such negative results in the search for Typhoid Bacilli, as recorded by well known authorities on the subject, are not unusual even though infection has been conveyed by any particular source under examination. In view of this fact every possible steps should be taken to ensure the safety of all water supplies, dealing effectively with all doubtful sources. As will be seen later under general measures such steps have been taken so far as it is possible.

(3).—*Helminthic Disease.*

43. In Europeans the number of cases treated for intestinal entozoa is very small: 2 cases of Trematode; 4 cases of Cestode and 3 of Ascaris. In natives the incidence of the various intestinal entozoa from the cases treated is shewn by the following percentage figures:—

Tapeworms of all kinds	6.5%
Ascaris	68.5%
Ankylostome	23.4%
Oxyuris	1.2%
Others ... ..	.4%

The total cases treated for intestinal entozoa amount to 3,593 of which Cestodes form 237 Nematodes 3,356 of the latter Ascaris comprise no less than 2,463. The foregoing percentage figures do not vary very much from those obtained in 1916. Ankylostome infection is wide spread and the cause of much sickness and incapacity for work especially amongst prisoners.

44. *Trematode Infection.*—4 cases of Fluke infection are reported.

45. *Guinea-Worm.*—719 cases of Guinea-worm were treated. Half the cases recorded occurred in the Western Districts.

III.—GENERAL MEASURES.

46. *Sewage Disposal.*—There is nothing new to add on this subject, the routine disposal of sewage into soil or water continues in practice. In one station the Medical Officer was adopting incineration with some considerable degree of success but the process entails care in obtaining the necessary primary separation of the solids.

47. *Latrines.*—The present difficulty in obtaining latrine pails and drums together with the increase in cost favours the use of “Salgas” or deep midden latrines wherever the soil and subsoil are favourable. Efforts were being made to improve the structural

efficiency for more general adoption. All necessary precautions are being taken with a view to preventing pollution of wells where they form the source of water supply by maintaining an adequate distance around wells free of any such sources of contamination.

48. *Disposal of Refuse.*—Disposal by burial entails the constant digging of pits for which labour is required and supervision so that it is covered over daily by earth. A small but efficient type of refuse destructor is needed to meet the situation at outstations; the difficulty is to get efficiency for a small outlay of money. The question will receive attention with a view to obtaining a suitable design for trial.

49. *Drainage.*—Surface drains constitute the drainage system in all places. Only in a few places such as Lagos, Calabar, Warri, and Abeokuta have permanent concrete or cement lined drains been constructed and that to a limited extent. Temporary surface drains cut in the soil silt up readily and require constant attention to be kept clear.

Extension of the permanent drainage is necessary but prohibitive at present owing to existing conditions. A proper drainage scheme should be drawn up for a place like Port Harcourt which is developing rapidly and will form a very important place.

50. *Bush Clearing.*—This is carried out at each station by means of prison labour mainly and to some extent by paid labour. Stations are usually well maintained; more attention is given to those in tsetse fly areas but much still remains to be done in such places to make and maintain permanent clearings around such stations by effecting the clearings and planting with Bahama grass.

51. *Markets and Slaughter-houses.*—With the organisation of townships both markets and slaughter houses will be established and this with the application of the Public Health Rules, which involves sanitary inspection of markets, cattle and meat, will advance sanitary interests in this respect.

52. *Infectious Diseases Hospital.*—Permanent Infectious Diseases Hospitals are maintained at Lagos, Calabar and Warri. At outstations temporary ones are maintained where necessary.

53. *Sanitary Stations.*—These are maintained at Lagos, Forcados and Bonny. Although few occasions for putting them to use have arisen yet it is satisfactory to know that quarantine stations are always available to deal efficiently with contacts when emergencies arise. Clayton machines are maintained at Lagos, Forcados and Calabar.

54. *Prisons.*—At several prisons increased accommodation has been provided, *e.g.*, at Port Harcourt, Aba, Agbor, Enugu and a few others but much yet remains to be done at many prisons to bring the accommodation up to the necessary sanitary standard. Prison accommodation needs to be augmented to meet the needs of the increasing number of prisoners; in 1916 there were 34,379 prison inmates whereas in 1917 there were 37,043, and the daily average for 1916 was 5,381 while in 1917 it rose to 7,060. The average death rate for all prisons for 1917 is 68·3 per 1,000. Diarrhoea, Dysentery, Ankylostomiasis and Bronchitis are the main causes of mortality. A decided improvement was made in the scales of dietary to what was in force previously. Whatever the standard scale of diet be it wants careful watching to see that the required foodstuffs are obtained regularly. Diet undoubtedly forms the basis of health in prisons and efforts are being made to maintain this at the necessary standard.

55. *Town planning and building Regulations.*—Building Regulations form the sanitary counterpart of Town Planning if the full benefits of Town Planning are to be achieved. So far as new Townships are concerned these are all being laid out on approved sanitary plans which are passed before the layout is proceeded with but regulations are necessary to govern the erection of buildings.

Town extensions, in the case of existing native towns and townships should be on similar approved plans and schemes of definite extension should be prepared for all places that are expanding and brought into operation so as to get development to take place on sanitary lines. This has been done in some cases such as Alders Town at Warri. The importance of building Regulations to go hand in hand with Town Planning, cannot be over-estimated. It is necessary to regulate buildings as regards site plans to procure adequate light and ventilation and at the same time reserve space for subsequent drainage schemes.

Reference was made to this subject in section 13 "Ordinances passed II and under Rules passed 4."

56. *Lagos and Ebute-Metta. Food.*—Bakeries have been registered and licensed and other establishments that prepare native food have been listed by the Medical Officer of Health. They are inspected regularly and cleanliness is made compulsory.

Cattle and other animals are rigidly inspected before slaughter and the meat after slaughter. A daily average of 25 cattle were slaughtered, 4·7 of sheep, 14·0 of goats and 4·6 of pigs. The presence of Tuberculosis in meat of cattle and pigs has been definitely established. In 54 cases Tuberculosis infection was found which amounts to '6% of the total number of animals slaughtered. Of the 54 animals found infected cattle form 85% and pigs 15%. Contagious Pleuro-Pneumonia was found in 87 cattle or '95%.

Reclamation.—Considerable reclamation has been carried out at Apapa by the Sand Dredger.

Extensive clearings of bush were also made at Apapa with a view to improving the general sanitary condition.

Water-supply.—Efforts are being made to restrict the digging of wells within a definite distance of the public water supply and to diminish the number of existing wells which yield a water supply the use of which for domestic purposes is accompanied by very considerable risk. The pipe borne water supply forms one of the greatest sanitary assets to Lagos and it is an extremely important one from the public health point of view. Some improvements at the Iju water works were desirable from the sanitary point of view. Recommendations were made with a view to effecting these improvements but they have not received the consideration they deserved at the hands of the Water Authority. No expenditure should be spared where the welfare of a large community is so directly concerned.

57. *Port Harcourt.*—A scheme for a pipe borne water supply for Port Harcourt is now in view.

The head waters of the Aba river have been investigated and the water supply is to be drawn from this source which is one of excellent physical characters and will prove sufficient in quantity through the year. Chemical analysis of samples of water gave favourable results shewing that the water was free from chemical and organic impurities. Bacteriologically the results were such that they indicate the need of filtration. The water is to be subjected to filtration at Aba before it is piped into Port Harcourt a distance of 51 miles. Plans of the proposed filtration system need to be submitted to the Sanitary Authority for approval before they are matured.

Lectures.

58. *In Lagos.*—The training of Sanitary Inspectors has throughout the year been carried out by Dr. Dalziel the Medical Officer of Health. Lectures, demonstrations, practical work with routine duties constitute the nature of tuition. Besides these the Sanitary Inspectors-in-Training, who are being prepared for the permanent service, receive a sound course of general education in King's College for which the Sanitary Department is much indebted to the principal and masters of the College who interest themselves in the advancement of the sanitary pupils.

59. *Teaching in Schools.*—The Director of Education has very kindly subscribed the following views on this subject for insertion into this report:—

“Elementary instructions in Hygiene and Sanitation forms a part of the curriculum of all Government Schools and such Mission Schools as are under Government inspection. The syllabus varies from object lessons in the elementary standard to a knowledge in the higher classes of the subject as set forth in Prout's or other simple text books.”

“Fair progress is undoubtedly being made.”

When on tour Sanitary Officers make it a point to speak on sanitary matters to Chiefs and advise them in the presence of one of the Political Officers as to sanitary measures and improvements to be carried out; schools have also been visited and short appropriate lectures given to the senior pupils and teachers on sanitary matters of practical interest.

IV.—RECOMMENDATIONS.

1. Past recommendations have yet to be overtaken and therefore stand.
2. Building Regulations are required for 2nd and 3rd class Townships.
3. A definite scheme of town planning with appropriate building regulations for the suburban expansion of Lagos and Ebute-Metta.
4. Increase in the Sanitary Staff both of Sanitary Officers and European Sanitary Inspectors is one to be kept definitely in view for sanitary work to make the desired advance in the vast field open to it.

Routine sanitary work at the present time fully occupies the time and energies of the depleted staff and normal times will have to be awaited when staff and means are available, for the maturing of many past recommendations and launching out on fresh ones.

I attach the following tables:—

1. Table I (Table IV of the Model Report).
2. Table of Statistics in reference to Prisons.
3. Table of cases of Infectious Diseases.
4. „ „ Helminthic Infection.
5. „ shewing returns of Anti-mosquito work.

H. ANDREW FOY,

Senior Sanitary Officer.

IV.—METEOROLOGICAL.

Seasonal variations appear to have but little influence on the health of Europeans. With the native it may be said that as a general rule he suffers from respiratory troubles during the dry harmattan and during the rains from intestinal complaints.

In Lagos during the cold sea wind that prevail in July and August the native suffers very severely from respiratory troubles.

The rainy season was on the whole heavier than usual particularly in Lagos, and the daily rain fall was more evenly distributed.

V.—HOSPITALS AND DISPENSARIES.

Station.	Nature of building.	Extent of Mosquito-proofing.	No. of Beds.		In-patients.	Out-patients.	Subsequent Attendances at Dispensary.	Operations performed.
			Male.	Female.				
Lagos—European	Brick and Wood	Completely	12	1	169	299	...	314
" Native ...	Wood and Iron	Partially	53	14	1,289	2,908	9,710	
" Massey Street Dispensary ...	Brick ...	None	...	...	...	11,662	62,576	4
" Ereko Dispensary	"	"	...	...	...	6,247	...	
" Ebute Metta Dispensary:—								
European	"	"	...	...	...	251	361	...
Native	"	"	...	...	...	5,463	22,182	...
" Prison Hospital and Dispensary:—								
European	"	"	...	...	198	1,122	4,511	...
Native	"	"	...	...	...	...	...	...
I.D.H.—European	"	Completely	6	4	54	47	430	...
" Native	"	"	25	13	51	...	...	...
Yaba Lunatic Asylum...	"	None	24	24	25	...	...	...
" Leper Asylum	"	"	21	12	37	...	...	...
Ibadan—European	Mud and thatch	"	5	...	551	76	254	52
" Native...	Wood on Iron pillars	Completely	16	4	137	3,194	...	14
Abeokuta—European	Brick ...	"	...	...	192	2,242	21,990	
" Native	None	None	8	8	...	...	...	...
" Mud with iron roof	Mud with iron roof	None	...	...	...	...	...	...
Badagry—European	None	Completely	6	...	...	...	...	...
" Native	Brick ...	"	6	...	28	256	449	...
Warri—European	Concrete	Partially	20	4	500	2,677	12,708	20
" Native ...	Brick ...	"	20	...	...	...	...	...
" I. D. Hospital	Brick and Mud	Completely	2	2	16	194	238	27
Sapele—European	Brick ...	Partially	16	2	129	2,176	7,887	...
" Native...	"	"	8	...	...	...	...	...
" I. D. Hospital	"	"	3	1	43	82	965	...
Onitsha—European	Brick and Wood	Completely	19	5	575	7,412	23,201	199
" Native	Cement and Wood	Partially	4	...	12	229	...	8
Forcados—European	Concrete	Completely	8	4	192	3,697	12,093	...
" Native	Brick ...	Partially	...	...	...	5	...	5
Agbor—European	None	"	6	...	259	1,732	11,808	...
" Native ...	Brick ...	"	8	...	288	20	6,148	22
Benin City—European	None	Partially	...	...	...	1,177	...	...
" Native	Brick ...	"	...	...	1,289	2,007	1,5787	3
Enugu—European	None	None	...	...	...	60	...	...
" Native...	Bush house	"	...	...	189	1,033	5,437	94
Okwoga—European	None	None	...	...	...	...	...	...
" Native	Bush house	None	...	...	...	...	...	...

V.—HOSPITALS AND DISPENSARIES—continued.

Station.	Nature of building.	No. of Beds.		Extent of Mosquito-proofing.	In-patients.		Out-patients.	Subsequent Attendances at Dispensary.	Operations performed.
		Male.	Female.						
Calabar—European ...	Wood ...	6	2	Completely	82	165	1,290	1,290	} 334
" Native ...	Brick ...	46	11	"	1,295	9,165	3,261	3,261	
" I.D. Hospital ...	Concrete	50	16	"	...	...	...	...	...
Bonny—European ...	None ...	...	...	"	...	33	...	...	...
" Native ...	Brick ...	10	3	Partially	142	1,567	4,840	4,840	10
" I.D. Hospital ...	"	8	4	None	...	...	...	...	...
Brass—European ...	None ...	...	...	"	...	18	...	...	...
" Native ...	Brick ...	8	...	"	43	887	5,678	5,678	6
Degema—European ...	None ...	...	...	"	...	85	...	...	...
" Native ...	Brick ...	27	5	"	145	1,219	15,620	15,620	56
Ikot-Ekpene—European ...	None ...	...	...	"	...	10	30	30	...
" Native ...	Brick ...	16	3	"	698	1,633	5,097	5,097	105
Opobo—European ...	"	4	...	Completely	12	158	...	...	...
" Native ...	Corrugated Iron	6	2	None	149	5,630	16,758	16,758	242
Owerri—European ...	None ...	...	...	"	...	10	...	...	...
" Native ...	Bush house ...	...	...	"	499	2,416	16,600	16,600	109
Port Harcourt—European ...	Wood and Iron	2	...	Completely	8	240	240	240	} 76
" Native ...	"	32	...	Partially	1,912	5,427	12,316	12,316	
Afikpo—European ...	None ...	...	...	"	...	15	...	...	...
" Native ...	Bush house ...	...	...	"	...	757	9,012	9,012	161
Ikom—European ...	None ...	...	...	"	330	11	...	...	...
" Native ...	Bush house ...	...	...	"	36	1,123	5,389	5,389	78
Obubra—European ...	None ...	...	...	"	...	...	...	...	...
" Native ...	Brick ...	4	2	"	...	...	...	...	...
Agwashi Oku—Native ...	Mud and thatch	...	...	"	60	33	289	289	...
Obudu—European ...	None ...	...	...	"	...	1	...	...	...
" Native ...	Brick ...	...	...	"	8	482	6,479	6,479	...
Okigwi—European ...	None ...	...	...	"	...	7	...	...	...
" Native ...	Bush house ...	...	...	"	245	1,921	11,669	11,669	...
Ogoja—European ...	None ...	...	...	"	...	5	...	...	...
" Native ...	Bush house ...	...	...	"	71	905	5,816	5,816	...
Abakaliki—European ...	None ...	...	...	"	...	20	...	...	...
" Native ...	Bush house ...	...	...	"	212	1,029	11,157	11,157	157
Victoria --European ...	Brick ...	6	...	"	16	...	...	...	...
" Native (16) ...	Brick and galvanised iron	401	...	One completely	6,287	19,560	105,344	105,344	22
" I.D. Hospital ...	Galvanised iron	99	...	None	...	...	...	...	...
Buea—European ...	None ...	...	...	"	...	20	...	...	...
" Native ...	Galvanised Iron	10	...	"	166	2,148	9,637	9,637	...
Ossidinge --European ...	None ...	...	...	"	...	...	...	...	...
" Native ...	Galvanised Iron	4	...	"	...	...	...	...	...
Bamenda—European ...	None ...	...	...	"	...	28	...	...	...
" Native ...	Brick ...	20	4	None	285	945	8,325	8,325	4
Total ...	—	—	—	—	18,787	114,091	473,582	473,582	2,122

VI.—SCIENTIFIC.

Owing to the depletion of the Staff, Medical Officers have had but little time to devote to research work.

Reports of interesting cases are however included in the Appendix as well as the Reports by the Director of the Medical Research Institute and the Government Chemist.

H. B. S. MONTGOMERY,

Acting Principal Medical Officer.

5th July, 1918.

TABLE IV.
TOWN AREA AND OPEN SPACES.

Name of Town.	1916.		1917.	
	Approximate Area in Acres.	Number of Proclaimed Open Spaces.	Approximate Area in Acres.	Number of Proclaimed Open Spaces.
Lagos	1,152	3	1,152	3
Calabar	9.2 sq. miles	3	9.2 sq. miles	3

(2).—POPULATION.

Name of Town.	1916.			1917.		
	Number of Europeans.	Number of Natives.	Total.	Number of Europeans.	Number of Natives.	Total.
Lagos	600	78,680	79,280	600	80,000	80,600
Calabar	118	16,588	16,706	130	10,698	10,828

(3).—HOUSING.

Town.	1916.				1917.			
	Houses.		Huts.		Houses.		Huts.	
	Number occupied by Europeans.	Number occupied by Natives.	Number occupied by Europeans.	Number occupied by Natives.	Number occupied by Europeans.	Number occupied by Natives.	Number occupied by Europeans.	Number occupied by Natives.
Lagos	270	5,000	...	12,000	272	5,070	...	12,173
Calabar	65	54	...	2,284	65	54	...	2,287

(4).—MOSQUITO-PROTECTION OF HOUSES.

Town.	1916.				1917.			
	Number wholly mosquito-protected.	Number with mosquito-proof room.	Number wholly mosquito-protected during the year.	Number partially mosquito-protected during the year.	Number wholly mosquito-protected.	Number with mosquito-proof room.	Number wholly mosquito-protected during the year.	Number partially mosquito-protected during the year.
Lagos	28	137	3	15	25	141	...	...
Calabar ... ..	...	7	...	1	...	7	...	...

TABLE IV—*continued.*

(5).—ERECTION OF NEW BUILDINGS DURING THE YEAR.

Town.	1916.					1917.				
	No. of public buildings erected with full sanction as to site, &c.	No. of houses erected with full sanction as to site, &c.	No. of huts erected with full sanction as to site, &c.	No. of houses built without sanction.	No. of huts built without sanction.	No. of public buildings erected with full sanction as to site, &c.	No. of houses erected with full sanction as to site, &c.	No. of huts erected with full sanction as to site, &c.	No. of houses built without sanction.	No. of huts built without sanction.
Lagos ...	1	90	164	...	...	2	70	173	...	...
Calabar ...	1	...	19	2	33	...	...	4	...	...

ACTION TAKEN.

Town.	1916.				1917.			
	No. of prosecutions.		No. demolished.		No. of prosecutions.		No. demolished.	
	Houses.	Huts.	Houses.	Huts.	Houses.	Huts.	Houses.	Huts.
Lagos ...	1	2	...	...	1	...	...	...
Calabar ...	1	8	2	71	...	...	...	11

(6).—MARKETS.

Town.	1916.			1917.		
	Total Number.	Number paved and drained.	Number unpaved.	Total Number.	Number paved and drained.	Number unpaved.
Lagos ...	10	5	5	10	5	5
Calabar ...	5	...	5	5	...	5

(7).—SLAUGHTER HOUSES.

Town.	1916.			1917.		
	Total Number.	Number paved and drained.	Number unpaved.	Total Number.	Number paved and drained.	Number unpaved.
Lagos ...	2	2	...	2	2	...
Calabar ...	1	1	...	1	1	...

(8).—LATRINES—PUBLIC.

TOWN.	1916.										1917.									
	No. of Latrines.					No. erected during the year.					No. demolished during the year.					No. repaired during the year.				
	Male.		Female.		Number.	Male.		Female.		Number.	Male.		Female.		Number.	Male.		Female.		Number.
	Number.	Number of seats.	Number.	Number of seats.		Number.	Number of seats.	Number.	Number of seats.		Number.	Number of seats.	Number.	Number of seats.		Number.	Number of seats.	Number.	Number of seats.	
Lagos ...	37	236	37	226	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Calabar ...	18	37	17	124	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

LATRINES—continued. (PRIVATE).

TOWN.	1916.										1917.									
	No. of private latrines.					Average No. of pails of nightsoil removed daily.					Average No. of clean pails substituted for soiled pails.					No. of nightsoil men employed.				
	No. of private latrines.		Average No. of pails of nightsoil removed daily.		Number.	Average No. of clean pails substituted for soiled pails.		No. of nightsoil men employed.		Number.	No. of cesspools.		No. of cesspools cleaned.		Number.	No. of new cesspools constructed during the year.		No. of old cesspools abolished.		Number.
	Number.	Number of seats.	Number.	Number of seats.		Number.	Number of seats.	Number.	Number of seats.		Number.	Number of seats.	Number.	Number of seats.		Number.	Number of seats.	Number.	Number of seats.	
Lagos ...	6,500	930	930	289.01	...	930	709.54	159	74	...	...	...	...	...	...	...	...	...	...	...
Calabar ...	511	511	511	511	...	511	511	74	74	...	...	...	...	...	...	...	...	...	...	...

(9).—REMOVAL OF REFUSE.

	1916.						1917.					
	TOWN.			Number of dust-bins.	Number of carts removing street refuse daily.	Amount of refuse removed daily.	Number of carts removing refuse from yards and premises daily.	Amount of refuse removed daily.	Number of carts removing refuse from yards and premises daily.	Amount of refuse removed from yards and premises daily.	Number of men employed for removing refuse.	
Lagos	55	20	19—20	...	...	...	20 tons.	257	263
Calabar	74	7	39 Cartloads.	...	8·09 Cartloads.	...	43·77 Cartloads.	73	82

(10).—MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

1916.												1917.													
Town.	Buried or Trenched.			Burnt.			Thrown into Sea.			Otherwise dealt with.			Buried or Trenched.			Burnt.			Thrown into Sea.			Otherwise dealt with.			
	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	Daily average number of pails of excreta.	Daily average number of cart-loads of refuse.	Daily average number of cart-loads of offal.	
Lagos	...	...	...	...	90·100 tons	...	...	...	...	...	...	...	...	...	...	...	120 tons	120 tons	...	...	...	...	...	...	...
Calabar	79	8·09	...	...	210	30·91	1·02	...	...	...	...	...	168·9	4·37	very small quant.	4·26	...	211·7	35·14	small quant.	...	...	...	...	...

11. Average daily number of cartloads of tin cans, bottles, broken crockery, and other incumbustible materials removed from houses, huts, and compounds.

Town.	1916.	1917.
Lagos ... ..	...	...
Calabar	48 Cartloads from public streets and spaces.	22 Cartloads from public streets and spaces.

(12).—WATER SUPPLY.

PIPE-BORNE WATER.

Town.	1916.				1917.			
	Source (river, lake or spring).	No. of linear yards.	No. of public standpipes.	No. of private standpipes.	Source (river, lake or spring).	No. of linear yards.	No. of public standpipes.	No. of private standpipes.
Lagos	River	83,344 yards (28" main -17 miles).	171	215	River	83,344 yards (28" main -17 Miles).	172	298
Calabar ... ..	...	19,560	6	102	...	19,560	6	102

WELLS.

Town.	1916.				1917.			
	Public.		Private.		Public.		Private.	
	Number.	Number with pumps protected against surface water and mosquitoes.	Number.	Number with pumps protected against surface water and mosquitoes.	Number.	Number with pumps protected against surface water and mosquitoes.	Number.	Number with pumps protected against surface water and mosquitoes.
Lagos	5	1	2,889	..	7	..	2,885	8
Calabar ... ..	...	...	2	..	...	...	2	..

TANKS (PUBLIC).

Town.	1916.						1917.					
	Number under-ground.	Number mosquito protected and served by pumps.	Number above ground.	Number mosquito protected.	Number of 400 galls. capacity or less.	Number above 400 galls.	Number under-ground.	Number mosquito protected and served by pumps.	Number above ground.	Number mosquito protected.	Number of 400 galls. capacity or less.	Number above 400 galls.
Lagos ... ..	...	...	2	2	2	...	...	...	2	2	2	...
Calabar	3	...	2	1	...	5	3	...	2	1	...	5

TANKS (PRIVATE).

Town.		1916.							1917.				
		Number under wood.	Number mosquito protected and served by pumps.	Number above ground.	Number mosquito protected.	No. of 400 galls. capacity or less.	Number above 400 galls.	Number under ground.	Number mosquito protected and served by pumps.	Number above ground.	Number mosquito protected.	No. of 400 galls. capacity or less.	Number above 400 galls.
Lagos	...	1	1	574	544	431	144	...	...	492	431	351	141
Calabar	...	...	...	46	46	17	29	...	...	50	47	21	29

NATURE OF TANKS.

Town.				1916.			1917.		
				Wood.	Iron.	Concrete.	Wood.	Iron.	Concrete.
Lagos	456	121	...	371	121
Calabar	46	...	...	50	...

BARRELS.

Town.				1916.		1917.	
				Number.	Number mos-quito protected.	Number.	Number mos-quito protected.
Lagos	...	...	...	545	288	489	170
Calabar	...	...	...	271	1	295	1

(13).—DRAINAGE.

PUBLIC MASONRY DRAINS.

Town.						1916.				1917.	
						Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.	Linear yards.	Linear yards constructed during the year.	Linear yards repaired during the year.
Lagos	...	...	...	...	...	31,995	1,599	...	32,756½	98½	100
Calabar	...	...	...	...	...	13,514¼	...	21/1/3	13,715	...	1½

PRIVATE DRAINS (MASONRY DRAINS).

Town.	1916.			1917.		
	Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.	Linear yards.	Linear yards reconstructed during the year.	Linear yards repaired during the year.
Lagos Calabar	... 16,669	... ...	... 393	... 16,669	... ...	... 39

PUBLIC DRAINS—*continued.* EARTH DRAINS OR DITCHES.

Town.	1916.			1917.		
	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.
Lagos Calabar	900 15,724	6,570 ...	Weekly Once every 2 months.	7,470 15,724	962 ...	Bi-monthly. Monthly.

PRIVATE DRAINS—*continued.* EARTH DRAINS OR DITCHES.

Town.	1916.			1917.		
	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.	Linear yards of ditches cleaned.	Linear yards of ditches dug and graded.	Average frequency of clearing ditches of grass.
Lagos Calabar	... 3,724	... ...	... Once every 2 months.	... 3,724	... ...	... Monthly.

(14).—CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

Town.	1916.		1917.	
	No. of Square yards of weeds, grass and vegetation cut and removed.	Average frequency of clearance of rank vegetation on the same area.	No. of Square yards of weeds, grass and vegetation cut and removed.	Average frequency of clearance of rank vegetation on the same area.
Lagos Calabar	71,900 9,488,840	6 weeks Monthly	95,040 6,809,028	Bi-monthly. Monthly.

(15).—EXCAVATION AND LOW-LYING LAND.

Town.	1916.							1917.						
	No. of pools and excavations.	Number of excavations filled up.	Amount of low-lying and marsh land raised and drained.	Number of pools, marshes, streams, &c., fish stocked.	No. of cubic yards of material used for filling up pools and excavations.	Number of persons fined for making new excavations.	Average No. of men daily employed in filling up pools, &c.	No. of pools and excavations.	Number of excavations filled up.	Amount of low-lying and marsh land raised and drained.	Number of pools, marshes, streams, &c., fish stocked.	No. of cubic yards of material used for filling up pools and excavations.	Number of persons fined for making new excavations.	Average No. of men daily employed in filling up pools, &c.
Lagos ...	...	...	9,200 sq. yds.	...	329,521	...	...	...	20	1,000 sq. yds.	...	2,304,490	...	265
Calabar ...	205	192	...	...	Unknown	...	...	210	190	...	...	Unknown	...	...

(16).—OILING.

Town.	1916.					1917.				
	Number of drains oiled.	No. of pools and excavations oiled.	No. of tanks and barrels oiled.	Average No. of men daily employed for oiling.	No. of drains oiled.	No. of pools and excavations oiled.	No. of tanks and barrels oiled.	Average No. of men daily employed for oiling.		
Lagos ...	117	4,637	210	3	138	7,324	167	3		
Calabar ...	317	175	5	1	145	132	45	5		

ANNUAL SANITARY REPORT ON PRISONS FOR 1917.

PRISONS.			Average No. of prisoners per night.	Site area in square yards per prisoner.	Percentage of area prison compounds covered by buildings.	Average cell space in cubic feet per prisoner.	Average ventilation area in square feet per prisoner.	Total number of prisoners medically treated.	Total number of prisoners unfit for duty.	Average number of days off duty of prisoners unfit.	Death rate per 1,000.
Abeokuta ...	...	...	172·26	47·1	11·5	402·6	3·6	349	117	8·7	17·4
Ibadan ...	...	...	126	26·1	24·3	237·1	2·9	377	39	11·2	55·5
Lagos ...	...	...	471·94	29·7	25·8	289·4	3·8	1,212	172	13·4	6·3
Benin-City ...	...	...	148·90	27·3	15·5	185·4	2·0	662	214	7·4	134·3
Forcados ...	...	...	55·7	159·0	7·3	344·2	6·1	342	53	7·7	...
Kwale ...	...	...	128·17	35·3	20·9	235·5	1·5	517	132	9·4	46·8
Okwoga ...	...	...	80·3	25·9	17·0	97·1	·98	479	96	10·4	149·4
Onitsha ...	...	...	174·2	53·0	27·6	403·0	5·2	695	174	25·6	80·3
Sapele ...	...	...	119·64	84·6	11·5	621·8	8·7	399	67	12·4	41·7
Ubiaja ...	...	...	112·6	24·0	19·3	241·7	7·6	356	150	11·8	17·7
Udi ...	...	...	68·0	22·19	...	2820·5	·34	256	131	12·9	161·7
Warri ...	...	...	275·5	10·8	11·9	1116·8	9·7	886	429	18·6	21·7
Enugu ...	...	...	623·03	21·7	15·8	152·3	2·9	2,391	998	9·0	181·3
Ogwashì ...	...	...	109·4	10·1	31·9	149·1	1·1	119	50	18·4	127·9
Afikpo ...	...	...	170·5	30·6	17·0	216·2	9·1	274	123	5·7	29·3
Okigwi ...	...	...	224·7	36·2	4·1	431·6	6·7	507	237	5·7	66·7
Ogoja ...	...	...	111·6	40·0	13·1	291·1	3·9	232	98	9·0	80·6
Abakaliki ...	...	...	82·8	36·8	26·0	419·9	5·4	216	44	6·1	48·3
Calabar ...	...	...	473·23	25·3	20·1	362·3	6·3	1,230	302	13·2	54·9
Opobo ...	...	...	234·6	15·6	27·2	382·2	7·7	506	92	6·5	...
Degema ...	...	...	116·57	68·5	26·2	554·2	9·7	560	99	9·4	34·3
Brass ...	...	...	43	57·5	12·7	578·9	5·5	97	38	12·2	69·7
Owerri ...	...	...	281·2	33·7	21·4	368·8	2·5	1,220	562	10·7	28·4
Ikot-Ekpene ...	...	...	378·12	56·2	15·0	373·1	4·4	1,506	914	18·4	52·8
Bonny ...	...	...	99·85	22·2	36·0	632·4	12·6	366	63	17·2	20·0
Obubra ...	...	...	118·26	...	...	...	...	398	101	10·8	135·2
Port Harcourt ...	...	...	930·1	53·2	8·0	285·7	3·1	7,166	1,558	8·3	184·2

Year.	Bert-hert.	Cerebro-spinal fever.	Chicken-pox.	Diphtheria.	Dysentery.	Euteric fever.	Erysipelas.	Gonorrhoea.	Influenza.	Leprosy.	Malaria.	Blackwater fever.	Measles.	Rubella.	Pappataci fever.	Pneumonia.	Rabies.	Relapsing fever.	Rheumatic fever.	Septicaemia.	Trypanosomiasis.	Small-pox.	Syphilis Primary.	Syphilis Secondary.	Syphilis Inherited.	Tetanus.	Tuberculosis.	Whooping Cough.	Yaws.	Yellow fever.	Others.
1917 ...	1	...	2,695	1	1,093	12	3	2,449	408	114	11,804	27	56	...	2	481	...	...	8	27	6	231	263	105	3	19	184	61	631	4	36
1916 ...	10	...	1,488	...	1,106	...	1	2,482	15	80	8,741	27	75	...	3	768	...	...	21	24	3	85	208	105	27	34	186	144	263	1	22
1915 ...	43	1	1,110	3	1,236	1	1	1,669	5	81	5,540	16	33	...	...	225	1	...	18	25	73	30	132	115	19	33	171	37	200	15	13
1914 ...	227	...	510	1	1,326	4	...	1,616	7	248	5,169	22	42	1	...	339	...	2	151	9	177	22	37	145	38	26	116	55	194	8	11
1913 ...	16	...	1,065	...	1,063	1	2	1,913	41	137	6,995	28	73	...	...	321	...	...	156	34	378	17	46	142	28	46	163	28	297	41	...
1912 ...	36	...	1,228	...	1,037	2	4	1,945	29	124	8,194	23	7	...	...	263	...	...	93	44	154	52	92	151	59	44	155	27	163	...	...
1911 ...	56	...	1,155	...	840	...	...	1,645	1	41	6,943	23	11	...	...	239	...	...	...	...	5	59	70	157	22	32	167	99	104	...	...

YEAR.	ANIMALS.			CESTODA.			NEMATODES.											
	Protozoa.	Trematoda (Flukes.)	Others.	Taenia Solium.	Taenia Saginata.	Others.	Ascaris.	Trichocephalus Dispar.	Dracunculus.	Filariasis.	Strongylus.	Ankylostomiasis.	Oxyuris.	Schistosoma.	Others.	Mylasis.	Others.	
1917	159	64	19	2,466	...	719	77	...	841	46	...	...	...	...	...
1916	189	23	2	2,667	...	568	86	...	688	8	...	...	...	16	...
1915	215	25	1	1,639	...	718	91	...	570	3	...	...	...	41	...
1914	69	58	...	1,910	...	635	32	...	335	2	...	3	...	25	...
1913	1	6	...	1,973	...	640	63	...	212	1	...	...	...	17	...
1912	1	17	...	2,673	...	625	95	...	405	36	...	...	...	10	...
1911	1	3	...	3,349	...	484	18	...	404	1	...	20	...	...	...

1917.—INSPECTIONS AND PROSECUTIONS.

Town.	1916.								1917.							
	No. of Inspectors employed.	No. of houses inspected.	No. of houses where larvæ were found.	No. of notices served to remove conditions causing breeding of Larvæ.	No. of persons fined for having mosquito Larvæ on premises.	No. of notices served to remove insanitary conditions on premises.	No. of persons fined for not removing insanitary conditions after notice.	No. of Soda and Aerated factories inspected.								
Lagos	29	630,586	13,555	...	665	2,935	18	2								
Calabar	5	98,415	210	205	183	3,750	14	1	32	632,287	13,186	208	1,158	1,760	1	2
									6	106,035	204	210	206	3,772	10	1

Town.

Station.	Houses inspected 1917.	Number of houses with larvae 1917.	Rainfall 1917.	Rainfall 1916.	Mosquito Index 1918.	Mosquito Index 1916.
Lagos and Ebute Metta	632,287	13,186	115·4	62·96	2·08	2·14
Abeokuta	16,716	2,326	89·5	...	13·9	...
Epe	14,687	332	85·8	53·5	2·2	2·47
Badagry	13,458	252	63·1	63·1	1·8	2·61
Ibadan I... ..	14,686	447	67·5	67·6	3·03	7·61
Warri	61,544	158	130·1	105·1	0·2	·56
Forcados	43,476	295	146·8	138·2	0·6	1·00
Sapele	13,213	13	106·3	77·9	0·09	·06
Koko	1,336	19	...	...	1·4	1·42
Benin City	10,536	217	94·0	71·7	2·05	2·53
Onitsha	26,546	50	66·9	74·2	0·1	·18
Siloko	6,386	42	...	...	·65	1·59
Okwoga	4,422	11	59·2	72·3	0·24	·16
Asaba	11,088	139	70·1	17·5	1·25	·60
Enugu	15,415	18	68·0	66·0	0·11	·21
Agbor	4,615	83	73·4	61·5	1·7	·87
Calabar	106,035	204	111·7	111·3	0·1	·21
Bonny	10,697	655	175·4	127·2	6·1	8·03
Brass	13,968	44	178·9	110·4	0·3	·38
Opobo	12,518	66	146·7	131·4	0·5	·71
Owerri	28,706	219	122·5	104·6	·76	1·00
Degema	18,751	274	89·0	74·7	1·4	1·21
Ikot-Ekpene	2,786	49	100·1	88·9	1·7	1·30
Ogoja	3,440	28	...	...	0·8	...
Abakaliki	1,521	22	82·9	80·5	1·4	·97
Obudu	2,438	16	78·8	88·3	0·6	·57
Afikpo	1,169	40	46·1	44·9	3·4	3·07
Port Harcourt	23,817	405	104·5	90·5	1·7	2·59

TABLE V.

METEOROLOGICAL RETURNS FOR THE YEAR 1916.

STATION—LAGOS.

			LAT. 6-27' N.		LONG. 3-24' E.			
			Absolute shade maximum	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches
January	...	...	90°·2	71°·5	88°·5	75°·0	84·4 %	0·23
February	...	...	90°·4	71°·5	88°·4	75°·5	81·8 %	2·97
March	...	...	94°	73°	90°·1	76°·4	76·9 %	3·22
April	...	...	92°	72°·1	88°·9	76°·1	75·9 %	6·18
May	...	...	104°·3	70°·1	88°·5	75°·3	79·7 %	12·32
June	...	...	89°·4	70°	86°·6	74°·1	84·2 %	19·34
July	...	...	87°·4	69°·1	84°·6	72°·9	88·0 %	29·36
August	...	...	89°	70°·5	82°·5	72°·9	89·7 %	22·77
September	...	...	92°·2	70°	84°·6	73°·8	83·2 %	9·93
October	...	...	96°	71°·2	87°·0	74°·1	81·1 %	4·94
November	...	...	95°	70°	88°·2	74°·8	81·1 %	2·63
December	...	...	89°	69°	87°·9	74°·4	85·3 %	1·60
Means	...	...	104°·3	69°	87°·9	74°·6	84·6 %	115·49

STATION—ONITSHA.

			LAT. 6-10' N.		LONG. 6-47' E.			
January	...	...	95°	70°	90°·4	73°·1	85 %	1·77
February	...	...	97°	70°	80°·5	74°·7	89 %	1·88
March	...	...	99°	71°	95°·4	75°·8	85 %	1·43
April	...	...	97°	70°	93°·0	74°·1	85 %	4·41
May	...	...	95°	70°	92°·9	74°·6	85 %	5·21
June	...	...	97°	70°	87°·3	73°·9	84 %	7·58
July	...	...	91°	70°	87°·3	73°·5	89 %	7·58
August	...	...	87°	70°	84°·2	73°	94 %	17·47
September	...	...	91°	70°	89°·5	73°·2	94 %	8·86
October	...	...	94°	70°	88°·7	73°·3	89 %	7·81
November	...	..	94°	70°	90°·3	73°·2	84 %	2·95
December	...	...	95°	70°	92°	73°·5	80 %	...
Means	...	...	99°	70°	89°·2	73°·4	76 %	96·95

STATION—FORCADOS.

			LAT. 5° 23' N.		LONG. 5° 26' E.			
January	88°	69°	85°·4	73°·1	85 %	2·35
February	97°	69°	95°·5	73°·8	85 %	5·54
March	91°	70°	87°·3	74°·8	85 %	2·92
April	94°	70°	87°·4	73°·3	80 %	6·01
May	92°	69°	86°·0	73°·0	85 %	15·56
June	89°	70°	84°·0	72°·5	85 %	11·81
July	85°	70°	82°·2	72°·6	89 %	23·38
August	83°	68°	80°·4	71°·9	89 %	42·55
September	83°	70°	81°·8	72°·0	84 %	17·57
October	87°	70°	83°·7	72°·1	80 %	11·15
November	87°	70°	84°·6	73°·0	84 %	3·96
December	89°	68°	85°·9	73°·2	80 %	4·05
Means	97°	68°	85°·3	72°·9	84 %	146·85

TABLE V.—*continued.*

STATION—IBADAN.

			LAT. 7° 24' N.		LONG. 3° 53' E.			
			Absolute shade maximum.	Absolute shade miiimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
January	...	...	98°	67°	91°·9	68°·1	89 %	0·25
February	...	...	97°	67°	93°·2	71°·9	89 %	2·40
March	...	...	102°	67°	98°·0	73°·3	94 %	0·60
April	...	...	99°	65°	96°·2	72°·0	89 %	3·40
May	...	...	99°	64°	91°·1	71°·0	89 %	8·50
June	...	...	96°	66°	88°·7	70°·4	89 %	8·85
July	...	...	92°	61°	86°·5	69°·9	89 %	8·36
August	...	...	88°	68°	83°·9	69°·8	89 %	13·96
September	...	...	92°	67°	86°·2	69°·5	89 %	11·75
October	...	...	94°	67°	91°·1	69°·9	89 %	5·93
November	...	...	93°	64°	90°·8	70°·1	89 %	2·75
December	...	...	94°	62°	92°·2	70°·3	89 %	0·80
Means	...	...	102°	61°	90°·8	70°·5	89 %	67·55

STATION—CALABAR.

			LAT. 4° 58' N.		LONG. 8° 19' E.			
January	87°	69°	85°·8	72°·6	75 %	10·65
February	89°	69°	86°·4	73°·2	76 %	3·79
March	92°	70°	90°·4	74°·0	76 %	3·40
April	92°	70°	88°·1	73°·1	80 %	3·29
May	93°	72°	87°·3	73°·6	80 %	3·32
June	89°	72°	85°·0	73°·2	85 %	12·15
July	89°	69°	83°·2	72°·9	84 %	13·20
August	86°	71°	81°·5	72°·4	84 %	18·42
September	86°	70°	83°·1	72°·1	84 %	14·23
October	89°	70°	84°·4	72°·2	85 %	13·78
November	89°	69°	85°·7	72°·5	85 %	11·91
December	90°	67°	86°·7	72°·9	80 %	3·65
Means	93°	67°	85°·6	72°·8	81 %	111·79

STATION—ENUGU NGWO.

			LAT. 6° 22' N.		LONG. 7° 25' E.			
January	...	...	93°	65°	90°·0	71°·1	72 %	1·28
February	...	...	96°	66°	90°·7	71°·2	75 %	0·50
March	...	...	99°	64°	94°·2	72°·1	64 %	3·91
April	...	...	98°	67°	93°·0	70°·9	58 %	4·87
May	...	...	96°	67°	89°·6	68°·1	63 %	3·70
June	...	...	96°	69°	92°	70°·9	64 %	6·60
July	...	...	95°	67°	90°·5	70°·2	64 %	7·93
August	...	...	94°	62°	86°·1	68°·5	84 %	23·35
September	...	...	93°	66°	89°·3	69°·4	76 %	10·07
October	...	...	92°	67°	89°·2	69°·2	76 %	4·02
November	...	...	90°	58°	84°·1	66°·8	80 %	1·77
December	...	...	92°	64°	88°·7	68°·2	80 %	...
Means	...	...	99°	58°	89°·7	69°·7	85·6%	68·00

TABLE VI.

RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.	
		Admis- sions.	Deaths.			Cases treated.	Deaths.
INFECTIVE DISEASES:—							
Beri-Beri
Cerebro-Spinal Fever
Chicken Pox
Cholera
Dengue
Diphtheria
DYSENTERY:—							
(a) Amœbic	10	...	10	...	12	...
(b) Bacillary	1	...	1	...	6	...
(c) Type not determined	1	3	...	4	...	1	...
Endocarditis-infective
Enteric	3	...	3	...	...	...
Erysipelas	1	...
Gonorrhœa	1	...	1	...	34	...
Influenza	4	...	4	...	11	...
Kala-Azar
LEPROSY:—							
(a) Nodular
(b) Anaesthetic
MALARIA:—							
(a) Tertian	6	...
(b) Quartan
(c) Aestivo-autumnal	4	152	1	156	7	448	1
(d) Chronic	7	...
(e) Type not determined
Blackwater Fever	2	11	5	13	2	9	6
Measles	1	...
Papataci Fever	1	...
Plague
Pneumonia	1	...	1	...	...	...
Pyrexia of uncertain origin
Rabies
Relapsing Fever
Rheumatic Fever
Septicaemia	2	...	2	...	...	...
Small-Pox
Syphilis (a) Primary	11	...	11	...	1	...
(b) Secondary	1	...	1	...	...	...
(c) Inherited
Tetanus
Trypanosomiasis (Sleeping Sickness)	1	...	1	...	1	...
Tuberculosis	3	1	3	...	3	1
Undulant Fever
Whooping Cough
Yaws
Yellow Fever	2	1	2	...	...	...
Other Diseases	6	...
INTOXICATIONS:—							
Alcoholism	5	1	5	...	4	...
Morphinism
Other Intoxications
GENERAL DISEASES:—							
Anæmia	8	...	8	1	146	...
Anæmia-Pernicious	5	...
Diabetes	2	...
Exophthal mic goitre

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR
THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.	
		Admis- sions.	Deaths.			Cases treated.	Deaths.
GENERAL DISEASES— <i>continued.</i>							
Gout	2	...	2	...	5	...
Leucocythæmia
Lymphadenoma
Myxœdema
Purpura
Rickets
Scurvy
Other Diseases	2	...	2	...	30	...
LOCAL DISEASES.							
DISEASES OF THE NERVOUS SYSTEM.							
Sub-section 1.—Diseases of the Nerves:—							
Neuritis	3	...	3	...	6	...
Meningitis
Myelitis
Hydrocephalus
Encephalitis
Abscess of brain
Congestion of brain
Other Diseases	6	...	6	1	11	...
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—							
Apoplexy
Paralysis	1	...
Chorea
Epilepsy	3	...	3	...	2	...
Neuralgia	3	...	3	...	44	...
Hysteria	1	...	1	...	7	...
Other Diseases	6	...	6	...	8	...
Sub-section 3.—Mental Diseases:—							
Idiocy
Mania	1	...	1	...	...	...
Melancholia	1	...
Dementia	1	...	1	...	...	1
Delusional Insanity	1	...
Other Diseases	1	...
DISEASES OF THE EYE:—							
Conjunctivitis	25	...
Keratitis	1	...
Ulceration of cornea	1	...
Iritis	1	...	1	...	...	...
Optic neuritis
Cataract
Other Diseases	10	...
DISEASES OF THE EAR:—							
Inflammation	3	...	3	...	32	...
Other Diseases	1	...	1	...	32	...
DISEASES OF THE NOSE:—							
Inflammation	7	...
Other Diseases	17	...
DISEASES OF THE CIRCULATORY SYSTEM:—							
Pericarditis
Endocarditis	1	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR
THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.	
		Admis- sions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES— <i>continued</i> .							
DISEASES OF THE CIRCULATORY SYSTEM— <i>continued</i> .							
Valvular Disease:—							
(1) Mitral	2	...	2	...	4	...
(2) Aortic
(3) Tricuspid
(4) Pulmonary
Arterial sclerosis	2	...	2	...	1	...
Aneurism	1	1
Other Diseases	2	...	2	...	2	...
DISEASES OF THE RESPIRATORY SYSTEM:—							
Laryngitis	1	...	1	...	14	...
Bronchitis	3	...	3	...	108	...
Broncho-pneumonia	2	...	2	...	8	...
Abscess of Lung
Gangrene of Lung
Emphysema
Pleurisy	2	...	2	...	1	...
Empyema
Other Diseases	19	...
DISEASES OF THE DIGESTIVE SYSTEM:—							
Stomatitis	10	...
Caries of teeth	31	...
Pyorrhœa alveolaris	4	...	4	...	6	...
Glossitis	1	...
Sore throat	26	...
Inflammation of tonsils	9	...	9	...	34	...
Gastritis	12	...	12	...	98	...
Ulceration of stomach	1	...	1	...	...	...
Hæmatemesis
Dilatation of stomach	2	...	2	...	...	...
Stricture of stomach
Dyspepsia	3	...	3	...	151	...
Enteritis	7	...	7	1	20	...
Appendicitis	4	...	4	...	1	...
Colitis	5	...	5	...	8	...
Ulceration of intestines
Sprue
Hernia	2	...
Diarrhœa	4	...	4	...	70	...
Constipation	1	...	1	...	95	...
Colic	1	...	1	...	25	...
Hæmorrhoids	1	...	1	...	15	...
Pancreatitis
Hepatitis—Acute	6	...	6	...	15	...
Abscess	1	...	1	...	...	...
Cirrhosis
Jaundice	2	...	2	1	2	...
Peritonitis
Ascites
Other Diseases	2	...	2	...	16	...
DISEASES OF THE LYMPHATIC SYSTEM:—							
Splenitis	2	...	2	...	2	...
Inflammation of lymphatic gland	7	...	7	...	12	...
Suppuration of lymphatic gland	7	...	7	...	5	...
Lymphangitis	1	...	1	...	1	...
Elephantiasis
Other Diseases

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN) FOR
THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.		
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.		
		Admis- sions.	Deaths.			Cases treated.	Deaths.	
LOCAL DISEASES— <i>continued.</i>								
DISEASES OF THE URINARY SYSTEM:—								
Acute nephritis	1	1	1	...	2	...
Bright's Disease	2	1	2	...	...	...
Pyelitis
Calculus	2	...	2	...	...	...
Renal colic	4	...
Cystitis	1	...	1	...	23	...
Vesical calculus	1	...
Suppression	1	...	1	...	...	...
Hæmaturia	1	...
Chyluria
Other Diseases	5	...
DISEASES OF THE GENERATIVE SYSTEM:—								
Male Organs:—								
Urethritis	3	...	3	...	21	...
Gleet	1	...
Stricture	4	...
Prostatitis	2	...	2	...	3	...
Soft chancre	1	...	1	...	12	...
Condyloma
Inflammation of scrotum	1	...
Hydrocele
Orchitis	5	...
Epididymitis	1	...
Abscess of testicle
Other Diseases	1	...	1	...	6	...
Female Organs:—								
Ovaritis
Ovarian cyst
Endometritis
Displacement of uterus
Vaginitis
Amenorrhœa	1	...
Dysmenorrhœa
Menorrhagia
Leucorrhœa
Other Diseases
AFFECTIONS CONNECTED WITH PREGNANCY:—								
Abortion
Other Affections
AFFECTIONS CONNECTED WITH PARTURITION:—								
Delayed Labour
Retained placenta
Premature Birth
Other Affections
AFFECTIONS CONSEQUENT ON PARTURITION:—								
Post-partum hæmorrhage
Puerperal septicæmia
Mastitis
Abscess of breast
Other Affections
DISEASES OF ORGANS OF LOCOMOTION:—								
Osteitis	2	...	2	...	1	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS		
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.		
		Admis- sions.	Deaths.			Cases treated.	Deaths.	
LOCAL DISEASES— <i>continued.</i>								
DISEASES OF ORGANS OF LOCO- MOTION— <i>continued.</i>								
Arthritis	3	...	3	...	36	...	
Spondylitis	
Bursitis	2	...	2	...	4	...	
Myalgia	5	...	5	...	60	...	
Other Diseases	15	...	
DISEASES OF CONNECTIVE TISSUE:—								
Cellulitis	3	...	3	1	13	...	
Abscess	8	...	8	1	21	...	
Other Diseases	3	...	
DISEASES OF THE SKIN:—								
Ulcer	9	...	9	1	29	...	
Urticaria	8	...	
Eczema	1	...	1	...	50	...	
Boil	2	...	2	...	55	...	
Carbuncle	
Herpes	2	...	
Psoriasis	
Oriental sore	1	...	
Tinea	89	...	
Scabies	21	...	
Acne	2	...	
Prickly heat	23	...	
Other Diseases	7	...	7	...	37	...	
INJURIES:—								
General	1	3	...	4	...	9	...	
Local	17	...	17	1	132	...	
TUMOURS:—								
Benign	4	...	
Malignant	1	...	
Malformations	1	...	1	...	...	...
POISONS:—								
Vegetable	
Animal	1	...	
Other Poisons	2	...	
PARASITES.								
ANIMAL PARASITES:—								
Protozoa	
Trematoda (Flukes)	2	...	
Cestoda:—								
Tænia solium	1	...	1	...	1	...	
Tænia saginata	2	...	
Other Cestodes	1	...	
Nematoda:—								
Ascaris	3	...	
Tricocephalus dispar	
Trichina	
Dracunculus	
Filaria	7	...	
Strongylus	
Ankylostomum	
Oxyuris	
Other Nematodes	
Insecta:—								
Insects producing myiasis	
Dermatophilus penetrans	3	...	
Other Insects	7	...	
Total	8	426	11	434	17	2,488	12	

TABLE VII.

RETURN OF DISEASES AND DEATHS (NATIVE)
FOR THE YEAR 1917.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
INFECTIVE DISEASES:—						
Beri-Beri	1	3	2	4	...	...
Cerebro-Spinal Fever ... ..	...	...	...	...	...	...
Chicken Pox	31	2,463	5	2,494	196	201
Cholera ... ..	...	...	...	...	...	...
Dengue ... ..	...	...	...	...	...	...
Diphtheria ... ..	...	...	...	...	...	1
DYSENTERY:—						
(a) Amœbic	7	474	97	481	14	243
(b) Bacillary	2	47	16	49	...	9
(c) Type not determined	5	41	6	46	1	231
Endocarditis-infective ... ..	...	3	3	3	...	1
Enteric ... ..	...	9	3	9	...	...
Erysipelas ... ..	...	1	...	1	...	1
Gonorrhœa	20	296	4	316	16	2,098
Influenza ... ..	...	94	...	94	5	299
Kala-Azar ... ..	...	...	...	...	...	...
LEPROSY:—						
(a) Nodular	20	12	...	32	23	8
(b) Anaesthetic	50	11	12	61	50	13
MALARIA:—						
(a) Tertian ... ..	...	1	...	1	...	10
(b) Quartan ... ..	...	...	...	...	...	3
(c) Aestivo-autumnal	24	1,509	19	1,533	26	9,409
(d) Chronic ... ..	...	...	...	...	...	223
(e) Type not determined ... ..	...	...	...	...	...	8
Blackwater Fever ... ..	...	5	2	5	...	...
Measles ... ..	...	16	...	16	...	39
Papataci Fever ... ..	...	1	...	1	...	...
Plague ... ..	...	...	...	...	...	...
Pneumonia	8	340	95	348	31	135
Pyrexia of uncertain origin ... ..	...	11	...	11	...	59
Rabies ... ..	...	...	...	...	...	...
Relapsing Fever ... ..	...	...	...	...	...	...
Rheumatic Fever	1	4	1	5	...	3
Septicaemia	2	15	12	17	...	8
Small-pox	6	143	29	149	14	82
Syphilis (a) Primary	2	59	...	61	3	190
(b) Secondary	4	34	1	38	2	66
(c) Inherited ... ..	...	...	...	...	...	3
Tetanus	1	12	7	13	...	6
Trypanosomiasis (Sleeping Sickness) ... ..	...	1	...	1	...	3
Tuberculosis	4	83	39	87	3	91
Undulant Fever ... ..	...	1	...	1	...	22
Whooping Cough ... ..	...	...	...	...	...	61
Yaws ... ..	...	165	...	165	6	516
Yellow Fever ... ..	...	2	1	2	...	...
Other Diseases ... ..	...	4	...	4	...	26
INTOXICATIONS:—						
Alcoholism ... ..	...	3	...	3	1	1
Morphinism ... ..	...	...	...	...	...	...
Other Intoxications ... ..	...	2	1	2	...	...
GENERAL DISEASES:—						
Anæmia	2	55	11	55	1	1,339
Anæmia-Pernicious ... ..	...	...	...	...	...	10
Diabetes ... ..	...	1	...	1	...	1
Exophthalmic goitre ... ..	...	5	...	5	...	7

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
GENERAL DISEASES—continued.						
Gout ... ..	...	...	...	...	...	...
Leucocythæmia ... ..	...	1	1	1	...	1
Lymphadenoma ... ..	...	1	...	1	...	2
Myxœdema ... ..	...	...	...	...	...	...
Purpura ... ..	...	...	...	...	...	...
Rickets ... ..	...	...	...	...	...	5
Scurvy ... ..	...	...	...	...	...	...
Other Diseases ... ..	...	...	...	...	...	...
LOCAL DISEASES.						
DISEASES OF THE NERVOUS SYSTEM.						
Sub-section 1.—Diseases of the Nerves:—						
Neuritis ... ..	...	12	...	12	1	104
Meningitis	1	11	9	12	...	2
Myelitis ... ..	...	...	...	...	...	...
Hydrocephalus ... ..	...	...	...	...	...	1
Encephalitis ... ..	...	...	...	...	...	1
Abscess of brain ... ..	...	1	1	1	...	...
Congestion of brain ... ..	...	2	2	2	...	19
Other Diseases	2	2	2	4	1	19
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—						
Apoplexy ... ..	...	4	3	4	...	1
Paralysis... ..	1	16	7	17	...	15
Chorea ... ..	...	...	...	...	...	2
Epilepsy ... ..	...	18	2	18	...	32
Neuralgia ... ..	...	203	1	203	1	1,988
Hysteria ... ..	...	1	...	1	...	7
Other Diseases ... ..	...	12	1	12	2	60
Sub-section 3.—Mental Diseases:—						
Idiocy	5	3	1	8	5	1
Mania	55	17	3	72	56	1
Melancholia	4	9	2	13	8	3
Dementia	2	4	2	6	...	2
Delusional Insanity	1	3	1	4	2	3
Other Diseases ... ..	...	1	...	1	...	5
DISEASES OF THE EYE:—						
Conjunctivitis	1	138	...	139	4	1,946
Keratitis... ..	...	7	...	7	1	47
Ulceration of cornea	1	6	...	7	...	19
Iritis ... ..	...	12	...	12	...	36
Optic neuritis ... ..	...	1	...	1	...	4
Cataract	1	8	...	9	...	22
Other Diseases	1	11	...	12	2	172
DISEASES OF THE EAR:—						
Inflammation	3	19	...	22	...	1,166
Other Diseases ... ..	...	5	...	5	...	618
DISEASES OF THE NOSE:—						
Inflammation ... ..	...	2	...	2	...	74
Other Diseases ... ..	...	2	...	2	...	37
DISEASES OF THE CIRCULATORY SYSTEM:—						
Pericarditis ... ..	...	9	4	9	1	10
Endocarditis ... ..	...	7	3	7	...	24

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
LOCAL DISEASES— <i>continued.</i>						
DISEASES OF THE CIRCULATORY SYSTEM— <i>continued.</i>						
Valvular Disease:—						
(1) Mitral	1	69	25	70	3	317
(2) Aortic ... ..	...	10	3	10	1	25
(3) Tricuspid ... ..	...	...	...	...	...	2
(4) Pulmonary ... ..	...	2	...	2	...	2
Arterial sclerosis ... ..	...	2	2	2	...	5
Aneurism ... ..	...	5	1	5	...	3
Other Diseases ... ..	...	20	6	20	...	19
DISEASES OF THE RESPIRATORY SYSTEM:—						
Laryngitis ... ..	...	4	...	4	...	125
Bronchitis	33	824	4	857	31	11,278
Broncho-pneumonia	1	58	23	59	...	33
Abscess of Lung ... ..	...	...	...	...	...	...
Gangrene of Lung ... ..	...	1	...	1	...	...
Emphysema ... ..	...	1	...	1	...	...
Pleurisy	3	93	4	96	4	211
Empyema ... ..	...	2	...	2	...	...
Other Diseases... ..	...	9	1	9	1	55
DISEASES OF THE DIGESTIVE SYSTEM:—						
Stomatitis ... ..	...	34	1	34	...	584
Caries of teeth ... ..	...	79	...	79	...	1,219
Pyorrhœa alveolaris	1	1	...	2	...	59
Glossitis ... ..	...	4	...	4	...	60
Sore throat ... ..	...	3	...	3	...	212
Inflammation of tonsils ... ..	...	10	...	10	...	275
Gastritis	1	74	...	75	4	607
Ulceration of stomach ... ..	...	2	...	2	...	4
Hæmatemesis	1	1	...	2	...	3
Dilatation of stomach... ..	...	1	1	1	...	1
Stricture of stomach ... ..	...	1	...	1	...	...
Dyspepsia ... ..	...	18	...	18	1	1,302
Enteritis... ..	...	54	15	54	...	108
Appendicitis ... ..	...	11	5	11	1	3
Colitis	1	17	3	18	...	105
Ulceration of intestines ... ..	...	5	4	5	...	...
Sprue ... ..	...	...	...	...	...	...
Hernia	20	311	11	331	22	228
Diarrhœa	32	1,360	103	1,392	25	2,886
Constipation	5	427	...	432	8	9,732
Colic	13	468	1	481	2	2,883
Hæmorrhoids	1	31	...	32	...	275
Pancreatitis ... ..	...	1	...	1	...	1
Hepatitis—Acute ... ..	...	14	1	14	1	62
Abscess ... ..	...	22	3	22	...	51
Cirrhosis .. ..	...	6	4	6	...	5
Jaundice... ..	...	5	...	5	...	8
Peritonitis ... ..	...	6	4	6	...	13
Ascites	1	23	6	24	3	14
Other Diseases... ..	...	27	2	27	...	80
DISEASES OF THE LYMPHATIC SYSTEM:—						
Splenitis ... ..	...	33	1	33	1	500
Inflammation of lymphatic gland	4	152	...	156	8	860
Suppuration of lymphatic gland	2	52	..	54	2	240
Lymphangitis ... ..	...	8	...	8	...	73
Elephantiasis	5	51	2	56	8	26
Other Diseases... ..	...	12	3	12	3	17

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.	
		Admis- sions.	Deaths.				
LOCAL DISEASES— <i>continued</i> .							
DISEASES OF THE URINARY SYSTEM:—							
Acute nephritis	37	15	37	2	54
Bright's Disease	...	2	27	17	29	1	36
Pyelitis	1	1	1	...	...
Calculus	3
Renal colic
Cystitis	...	1	15	2	16	1	91
Vesical calculus	2
Suppression	4	1	4	...	2
Hæmaturia	...	1	2	...	3	...	7
Chyluria	1
Other Diseases	18	4	18	2	35
DISEASES OF THE GENERATIVE SYSTEM:—							
Male Organs:—							
Urethritis	16	...	16	2	73
Gleet	1	...	1	...	23
Stricture	...	2	46	10	48	6	46
Prostatitis	2	...	2	...	4
Soft chancre	...	3	34	...	37	1	148
Condyloma	1	...	1	1	2
Inflammation of scrotum	...	1	1	...	2	...	7
Hydrocele	...	10	162	2	172	9	68
Orchitis	...	4	41	...	45	2	191
Epididymitis	...	2	21	...	23	2	29
Abscess of testicle	...	2	7	...	9	...	6
Other Diseases	...	2	45	2	47	3	52
Female Organs:—							
Ovaritis	13
Ovarian cyst	2	...	2	1	...
Endometritis	12	...	12	...	34
Displacement of uterus	11
Vaginitis	3	...	3	...	24
Amenorrhœa	59
Dysmenorrhœa	2	...	2	...	85
Menorrhagia	2	...	2	...	52
Leucorrhœa	2	...	2	...	38
Other Diseases	17	3	17	2	102
AFFECTIONS CONNECTED WITH PREGNANCY:—							
Abortion...	13	1	13	...	19
Other Affections	4	...	4	...	24
AFFECTIONS CONNECTED WITH PARTURITION:—							
Delayed Labour	18	2	18	...	5
Retained placenta	2
Premature Birth	1	...	1	...	4
Other Affections	3	...	3	...	4
AFFECTIONS CONSEQUENT ON PARTURITION:—							
Post-partum hæmorrhage	1	1	1	...	3
Puerperal septicæmia...	3	...	3	...	2
Mastitis	8	...	8	1	62
Abscess of breast	10
Other Affections	2	1	2	...	3

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
DISEASES OF ORGANS OF LOCO- MOTION :—						
Osteitis	2	26	1	28	2	183
Arthritis... ..	15	521	...	536	20	3,222
Spondylitis ... ..	...	...	...	...	...	37
Bursitis	1	9	...	10	1	72
Myalgia	1	135	3	136	2	4,120
Other Diseases	1	193	3	194	12	2,612
DISEASES OF CONNECTIVE TISSUE :—						
Cellulitis	8	252	3	260	13	1,252
Abscess	9	513	6	522	26	1,635
Other Diseases... ..	...	13	...	13	...	83
DISEASES OF THE SKIN :—						
Ulcer	50	1,009	2	1,059	38	12,205
Urticaria... ..	...	3	...	3	...	76
Eczema	9	445	1	454	4	3,298
Boil	3	179	...	182	2	1,320
Carbuncle ... ..	...	1	...	1	...	9
Herpes ... ..	...	4	...	4	...	63
Psoriasis... ..	...	...	...	...	...	4
Oriental sore ... ..	...	...	...	...	...	...
Tinea	1	18	...	19	...	1,523
Scabies ... ..	...	27	...	27	...	1,083
Acne ... ..	...	...	...	...	...	11
Prickly heat ... ..	...	...	...	...	...	14
Other Diseases... ..	2	31	2	33	1	450
INJURIES :—						
General	3	23	6	26	...	235
Local	52	1,971	44	2,023	66	16,332
TUMOURS :—						
Benign	1	64	1	65	2	135
Malignant	2	38	4	40	1	26
Malformations	1	5	...	6	...	17
POISONS :—						
Vegetable ... ..	...	2	2	2	...	4
Animal ... ..	...	6	1	6	...	18
Other Poisons ... ..	...	2	1	2	...	5
PARASITES.						
ANIMAL PARASITES :—						
Protozoa... ..	...	1	...	1	...	4
Trematoda (Flukes) ... ..	...	3	...	3	...	1
Cestoda :—						
Tænia solium	1	37	...	38	1	119
Tænia saginata ... ..	...	13	...	13	...	49
Other Cestodes ... ..	...	5	...	5	...	13
Nematoda :—						
Ascaris	2	47	...	49	2	2,414
Tricocephalus dispar ... ..	...	...	...	...	...	...
Trichina ... ..	...	...	...	...	...	...
Dracunculus	1	169	...	170	3	549
Filaria ... ..	...	1	...	1	...	69
Strongylus ... ..	...	...	...	...	...	...
Ankylostomum	6	507	87	513	19	328
Oxyuris ... ..	...	1	...	1	...	45
Other Nematodes ... ..	...	1	...	1	...	5
Insecta :—						
Insects producing myiasis ... ..	...	3	1	3	...	6
Dematophilus penetrans	2	2	...	4	...	40
Other Insects ... ..	...	5	...	5	...	35
Total	596	17,757	880	18,353	856	111,603

TABLE VIII.
SURGICAL OPERATIONS PERFORMED.

Total Number.	Cured.	Relieved.	Unrelieved.	Died.
2,122	1,907	144	26	45

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF
EUROPEAN OFFICIALS IN NIGERIA DURING 1916 AND 1917.

	NIGERIA.	
	1916.	1917.
Total number of European officials resident	1,708	1,633
Average number resident	1,055·3	1,120·13
Total number on sick list	1,020	1,731
Total number of days on sick list	11,241	12,110
Average daily number on the sick list	30·7	33·17
Percentage of sick to average number resident ...	2·9	2·96
Average number of days on the sick list to each patient	11	7
Average sick time to each resident	10·6	10·8
Total number invalided	89	87
Percentage of invalidings to total number resident ...	5·2	5·3
Percentage of invalidings to average number resident	8·4	7·7
Total number of deaths	14	22
Percentage of deaths to total number resident ..	·81	1·34
Percentage of deaths to average number resident ...	1·3	1·96



APPENDIX.



ANNUAL REPORT FOR THE YEAR, 1917.

BY W. RALSTON, B.Sc. (LOND.), F.I.C., Government Chemist, Nigeria.

The work done in the Chemical Laboratory during the past 12 months of 1917 included the examination of 254 Samples as classified in the table below, in addition to three special investigations and the usual official correspondence.

Nature.	Dept. Submitting.	No.	Total.
Gin	Customs	1	170
Whisky and Brandy		8	
Wines		13	
Essential Oils, Perfumes,		106	
Drugs and Toilet Requisites		41	
Matches		1	
Chemico-legal	Police	22	48
	Medical	11	
	Political	15	
Water	Sanitary	8	
	P.W.D.		
	Railway		
Mineral.			
Light Oils	Railway	2	
Kerosene and Engine Oils	P.W.D.	12	
	Railway		
Tar	Agricultural	2	
Coal	Railway	3	
Clays	P.W.D.	6	32
Limestones, etc.		7	
Miscellaneous	Municipal Health Officer	6	6
	Agricultural		
3 Special Investigations	—	—	264

2. *Customs Work.*—The bulk of the samples as usual were examined for the Customs Department; 170 samples altogether.

The Gin was a sample of Lion Brand from Onitsha giving a strength of 45% alcohol.

There were 7 samples of Whisky from Onitsha, Brass, Opobo and Port Harcourt, the strength ranging from 41 to 44% alcohol, which shows a fairly uniform composition for the five brands represented. The “Finest Old Scotch” gave 41% (Opobo) and 42% alcohol (Onitsha sample). “Green Stripe” Scotch Whisky showed 44% while “Heather Dew” (Port Harcourt) gave 43% alcohol. “Bull Dog” and “Kentucky Plumes” both gave 42% alcohol.

One sample of “New Moon” Brandy was found to contain 39% alcohol.

The 13 samples of Wine included 9 which were free from alcohol, being Ginger Brandy (2), Fermented Ginger Beer, Peppermint Cordial, Unfermented (Grape Juice) Wine, Welch’s Communion Wine and 3 Kola Wines. The other 4 samples were alcoholic, and included a Ginger Brandy (10·6% alcohol) and a Green Ginger Wine (12·7%) both from Lagos, a Port Wine with 14·6% and Sherry with 19%, both from Calabar.

All the above were found free from adulteration and any injurious ingredients.

Perfumes and Essential Oils.—Most of these samples were imported at Lagos; 1 was from Calabar, 2 from Burutu and 18 from Kano. Of these, 22 only contained alcohol, the others being either essential oils or perfumed oils or water. One essence was imported as

labelled "without alcohol" and found correctly described, but on a later date another lot was imported in similar bottles, etc., save for the omission of this small label, the reason evidently being that it was not free from alcohol, since it was found to contain about 67% alcohol.

Four samples contained 22% alcohol and under, other four from 32 to 35%; eight gave from 50 to 59%. two gave 65 and 67%, other two gave 75 and 77%, while the last two gave 81 to 87% alcohol.

Toilet Preparations and Drugs.—Eleven of these samples were for Hair Dressing and Mouth Washes, five were for external and the remaining twenty-six were for internal use. Five of the samples were received from Calabar, one each from Burutu, Opobo, Warri, and Koko, while the others (32) were imported at Lagos. Two samples were found to contain 77 and 83% alcohol respectively, six contained from 17 to 53%, eleven contained from 4 to 15% and the remaining twenty-two were found to be free from alcohol.

Matches.—One sample only was submitted, being the "Light Ship" brand, imported at Lagos. This was found free from White Phosphorus.

3. *Chemico-Legal.*—For the Police Department 6 exhibits were tested for blood stains, other 4 formed the constituents of a bomb suitable for extinguishing fires, and 12 exhibits were connected with four prosecutions at Lagos and one case at Ibadan.

The Medical Officers at Sapele, Lagos, Kano and Ebute-Metta submitted 3 specimens from two post-mortem cases, 3 specimens from two hospital cases, and five specimens of medicine, or foodstuff suspected of having been poisoned.

Fifteen specimens were submitted by the Political Officers at Ilorin, Abeokuta, Ondo, Aro-Chuku, Brass, Oyo, and Narraguta.

One specimen was connected with a post-mortem case, two were examined for blood stains, one sample was some native foodstuff (foo-foo) suspected of having been poisoned, seven were specimens of alleged native poisons, and four were medicines to be examined as to whether or not the vendor should have been licensed.

The report on the five exhibits from Ilorin was sworn before the Magistrate at Lagos, and there were other three Court cases at Lagos where I attended as a Crown Witness.

4. *Water.*—Four specimens of water from the Mineral Water Factory at Lagos were analysed, and this plant was thoroughly inspected by the Senior Sanitary Officer, the Municipal Health Officer and myself. As a result, the plant was thoroughly overhauled and special attention given to every process, especially the bottle-washing, being cleanly carried out, and since then the ærated water has been quite satisfactory. A specimen of the Iju water was analysed at the same time, as a standard for comparison, and found to be in a satisfactory state of purity. The sample was taken from one of the Laboratory taps in March.

Water, as use at the Mineral Water Factory at Ebute-Metta, was also analysed and found satisfactory. A sample of water from a borehole at Onitsha was found to be a very soft, fresh water, with some slight organic impurity.

The Chief Mechanical Engineer of the Government Railway submitted a sample of water from Lake Tatabu as to its suitability for use as a drinking water "with or without filtering". Only a general idea could be obtained as the sample was too small, but it appeared to be a soft, fresh water, with considerable amount of organic impurity, probably of vegetable origin and filtration was considered a very necessary precautionary measure before using it for drinking purposes.

5. *Mineral Analyses. Light Oils.*—The Traffic Manager of the Railway raised the question of classification of Gasoline and Petrol for freight purposes, and Laboratory samples of these were tested when Petrol (as used for motor cars) was found to be slightly heavier and to have slightly higher boiling point than Gasoline but both gave off inflammable vapour at the normal temperature of the Laboratory (84°F). As the "Flash Point" in each case would be well under this temperature, it was considered that in this country both should be considered as about equally dangerous as "Goods" for Railway Traffic.

Kerosene and Engine Oils.—The Flash Points of various samples of kerosene and engine oils were determined for the Railway and the Public Works Department.

Several mixtures with kerosene were made for the Electric Light Station in connection with running the Diesel Engines, and a curve showing the relationship between Flash Points and the percentage of kerosene was plotted from the results.

A sample of superheater cylinder Oil was tested for the Locomotive Department of the Railway, and as an experiment the addition of some petroleum jelly (vaseline) was suggested as probably likely to improve the action of this oil.

The acidity of a sample of Palm Oil was also determined with a view to its use in cylinders, etc.

Tar.—The Director of Agriculture submitted two samples of Tar from the ginnery of the British Cotton Growing Association at Zaria. The Tar was a bye-product derived from the use of Cotton Seed as a Fuel in the Producer Gas Plant. These tars were found to yield oils of a phenoloidal nature similar to other Wood Tars.

Coal.—Three Samples were analysed, two being from newly discovered out-crops at Ebu and the Niger Basin, and the sample of Udi coal was analysed for comparison. The Udi Coal showed a calorific power of 7,835 calories, while the Ebu and Niger Basin samples gave 5,120 and 4,910 calories respectively.

Clays.—The Chief Mechanical Engineer of the Railway submitted a sample of Fireclay from the Udi Coal Field with a view to its utility as a furnace lining, and the Public Works Department submitted four samples of ordinary clay from the Government Brickfields at Ebute-Metta, the aim being to improve the quality of the bricks turned out. The Marine Department submitted a sample of a black "Mud" raised by the Dredger from the Lagoon bed at Lagos, which was identified as a clay similar to that found in the Swamps near Lagos and used by the natives for making the red pottery-ware common in the native markets.

Limestone.—The Director of Public Works submitted six samples of rock and one of oyster shells for determination of the Calcium Carbonate present, to ascertain their values as possible sources of lime for building purposes. The results found for the Calcium Carbonate are tabulated below.

No. of Sample and Nature.					Calcium Carbonate.	Source.
Lb.					Percentage.	
145	Shells	...	...	...	93.9	?
256	Shell Conglomerate Rock	...			89.02	?
230	Rock	...	...	...	73.9	Amagunzi.
228	"				38.8	Nebo.
103	"				36.15	Ekoi Creek Hill.
104	"				16.33	
229	"				2.3	Umckpo. "

6. *Miscellaneous Work*.—A sample of acid was sent in from the Mineral Water Factory at Ebute-Metta for advice as to its suitability for use in preparing the carbonic acid gas, and the Municipal Health Officer submitted for identification two liquids used at the Lagos Mineral Water Factory, one being an acid mixture and the other called *Soda Improver*.

The "improver" proved to contain 10·2 grains common salt and 8·4 grains calcium chloride per gallon.

Two samples of Beans were tested for the Agricultural Department, and an Obach Dry Cell (from a stock of *new* cells which had deteriorated) was examined and a report submitted to the Telegraph Engineer.

Special Investigations.

A. *Experimental Work of Limes*.—A sample of the distilled lime oil had been submitted to the Imperial Institute, and a favourable report on it was received in September, 1916, (published in Gazette Supplement No. 60 of 14/12/16,. While on leave a visit was paid to the Imperial Institute in October, 1916, and certain pamphlets studied in regard to the West Indian industry. As a result it was arranged to send home (1) a sample lot of fresh limes for valuation and (2) a sample of Citrate of Calcium prepared from the juice as a source of Citric Acid for home industries. These samples were therefore prepared and sent to London. Favourable reports on them were submitted in May, 1917. The fresh limes arrived safely in good condition, but the demand for them is stated as limited and meantime it was pointed out attention should be directed to the preparation of lime products rather than to fresh limes.

The Citrate of Lime was reported on as a high-grade commercial article, which would find a good market in the United Kingdom, the price paid for Italian Citrate of Lime inclusive of freight and other charges amounting to £100 per ton (April 1917).

B. *Experimental Work on Isin Fruit*.—This tree has been recognised as the *Blighia Sapida* and Dr. H. H. Scott published an article ascribing the Vomiting Sickness of Jamaica to the effects of eating the unripe fruits of this tree, there colloquially called "Ackee." The Director of the Medical Research Institute proposes to examine whether the fruit had the same effects here as in Jamaica and with this object a number of aqueous decoctions were prepared in the Laboratory and administered to native puppy dogs kept at the Medical Research Institute. A joint report on this investigation has been submitted, from which it will be seen that the puppies died and post mortem sections of their livers and kidneys revealed a condition similar to that described by Dr. Scott. But, in my opinion, the Isin here is certainly not so deadly in its effects as the Ackees of Jamaica, for there the vomiting sickness occurred more or less periodically while in Lagos there have been no similar cases recorded, and the Isin fruit is eaten regularly by a large number of natives and some Europeans. The ripe fruits of both the Ackee and Isin however seem to cause no illness in any case when properly cooked.

C. *Food Value of Breadfruit*.—When this fruit was in season the opportunity was taken to have an analysis made to determine its value in comparison with those of other native foodstuffs previously analysed here. A separate report has been submitted, but it may be stated here that the breadfruit was

found to have about the same value as ordinary Irish potatoes, when it contained nearly the same percentage of moisture. This last point is of importance when results of other investigators are being considered, as naturally when the fruit dries, its residual solids should have a much greater food value, and so, if the percentage of moisture is overlooked in making comparisons, erroneous impressions may be formed.

MEDICAL RESEARCH INSTITUTE, ANNUAL REPORT, FOR 1917.

The ninth Annual Report is presented herewith.

The principal work was done on the subjects of Leprosy (treatment), the fruit of *Blighia sapida*, intestinal Protozoa, and *Filaria* in two species of Chrysops.

Dr. Connal was on duty, alone, from 1st January until 31st December 1917, Dr. Coghill having been seconded for duty in the Northern Provinces, and the post of Laboratory Attendant remaining unfilled.

There was no change in the pensionable native staff. The duties of Medical Officer in charge of the Yaba Lunatic and Leper Asylums were again undertaken by Dr. Connal.

Other non-research work included the keeping of meteorological records and a routine bacteriological examination of the Lagos Water Supply.

The section on Medical Entomology is based on the results obtained by Mrs. Summers Connal, who is responsible for all the identifications and for the dissections.

SOME EXPERIMENTS with the FRUIT of "BLIGHIA SAPIDA" in NIGERIA by A. CONNAL M.D., Director, Medical Research Institute, Lagos, and W. RALSTON, B.Sc., Government Chemist, Nigeria.

The paper read by Dr. H. H. Scott (1) before the Society of Tropical Medicine, London, describing his work on "Vomiting Sickness" in Jamaica, gave rise to the query, in the discussion which followed, "does the Ackee exist in West Africa?"

The answer had already been supplied by Dr. J. M. Dalziel. (2) *Blighia sapida* is indigenous to West Africa. There are numerous fruit-bearing specimens in and around Lagos.

The local (Yoruba) name of the fruit is "Isin." It is freely eaten by the natives, either raw or cooked, and some Europeans also consume it. There is a suggestive Yoruba saying that "he who knows to eat the Isin, knows to remove the poison."

Although there has not been any reason to suspect the occurrence of outbreaks of "Vomiting Sickness" in West Africa, it appeared advisable to ascertain whether or not the "Isin" possesses the poisonous properties ascribed to the "Ackee."

The conditions in Nigeria differ from those existing in Jamaica. There is no trade in the fruit. Very occasionally a basket of "Isin" is seen exposed for sale in the various markets, but for all practical purposes it may be accepted that the fruit is eaten only by those who collect it themselves from an easily accessible tree.

Further, it appears to be the general custom to eat only the "Arilli," discarding husk, seeds and "placentae."

The fruit ripens in April of each year.

The experiments now to be described were undertaken in April, 1917, and completed in May, 1917.

Four stages of the full-sized fruit were used:—

- (1) Unripe, with seeds still green,
- (2) „ „ „ black,
- (3) Ripe (as eaten),
- (4) Over-ripe.

Seven series of experiments were carried out before the fruiting season finished.

The animals chosen for use were native puppies.

First series of experiments.—Extracts were made from the following parts separated from the other parts of the fruit:—

- (a) Placenta (so called "poison part"),
- (b) Arilli („ "edible part"),
- (c) Husk a thick fleshy covering

These extracts were made by boiling for half-an-hour in tap-water, straining off the solid residue, and finally concentrating the resulting liquor to a bulk suitable for administration to the puppies.

EXTRACT No. 1.—Placentæ from 5 ripe Isin.

Dog I. Weight, 2,550 grammes.

Weight of placentæ, 2 grammes.

Weight of husks, 139 grammes.

Concentration of extract, 50 c.c.=husks of one Isin.

First dose, 12.5 c.c. by the mouth, 10 a.m., 10.4.17.

Second „ „ „ „ 2 p.m., „

Result, no apparent ill effects.

EXTRACT No. 2.—Husks from 5 ripe Isin.

Dog II. Weight, 1,800 grammes.

Weight of husks, 139 grammes.

Concentration of extract, 50 c.c.=husks of one Isin.

First dose, 25 c.c. by the mouth, 10 a.m., 10.4.17.

Second „ „ „ „ 2 p.m., „

Result, no apparent ill effects.

EXTRACT No. 3.—Placentæ from 3 over-ripe Isin.

Dog IV. Weight, 1,315 grammes.

Weight of placentæ, 2 grammes.

Concentration of extract, 25 c.c. = placentæ of one Isin.

First dose, 8 c.c. by the mouth, 10 a.m., 11.4.17.

Second „ „ „ „ „ 12.4.17.

Result, no apparent ill effects.

EXTRACT No. 4.—Husks from 3 over-ripe Isin.

Dog V. Weight, 1,030 grammes.

Weight of husks, 104 grammes.

Concentration of extract, 50 c.c. = husks of one Isin.

First dose, 17 c.c. by the mouth, 10 a.m., 11.4.17.

Second „ 25 „ „ „ „ 12.4.17.

Result, no apparent ill effects.

EXTRACT No. 5.—Arilli from 3 over-ripe Isin.

Dog III. Weight, 1,440 grammes.

Weight of Arilli, 22.5 grammes.

Concentration of extract, 25 c.c. = Arilli of one Isin.

First dose, 8 c.c. by the mouth, 10.30 a.m., 10.4.17.

Second „ 9 „ „ „ 2.30 p.m., „

Result, no apparent ill effects.

Dogs IV and V passed several Belascarids per anum a few hours after the second dose of extract.

The average weight of a whole “ripe” fruit was found to equal 43 grammes and of an “over-ripe” fruit, 51.5 grammes.

Second series of Experiments.—The placentæ alone were used. Thirty fruits of each stage, unripe green-seeded, unripe black-seeded, ripe and over-ripe were collected and the placentæ removed. Each of the four extracts used in this series, therefore, was prepared from the separated placentæ of 30 fruits at the same stage of growth.

It had been found in the first series of experiments that the saponaceous character of the extracts rendered mouth-feeding a tedious and inexact method of administration because of the profuse frothing. In this second, and in all subsequent series of experiments, a suitable stomach-tube was used, ensuring rapid, easy and exact administration.

EXTRACT No. 6.—Placentæ from 30 unripe green-seed Isin.

Dog II, as before.

Weight of placentæ extracted, 23 grammes.

Concentration of extract, 10 c.c. = placentæ from 5 Isin.

First dose, 5 c.c. by stomach tube, 11 a.m., 16.4.17.

Second „ 10 „ „ „ „ 17.4.17.

Result, no apparent ill effects.

EXTRACT No. 7.—Placentæ from 30 unripe black-seeded Isin.

Dog IV, as before.

Weight of placentæ extracted, 38 grammes.

Concentration of extract, 10 c.c. = placentæ from 5 Isin.

First dose, 5 c.c. by stomach tube, 11 a.m., 16.4.17.

Second „ 10 „ „ „ „ „ 17.4.17.

Result, no apparent ill effects.

EXTRACT No. 8.—Placentæ from 30 ripe Isin.

Dog III, as before.

Weight of placentæ extracted, 21.2 grammes.

Concentration of extract, 10 c.c. = placentæ from 5 Isin.

First dose, 5 c.c. by stomach tube, 11.30 a.m., 16.4.17.

Second „ 10 „ „ „ „ „ „ 17.4.17.

Result, no apparent ill effects.

EXTRACT No. 9.—Placentæ from 30 over-ripe Isin.

Dog I, as before.

Weight of placentæ extracted, 27 grammes.

Concentration of extract, 10 c.c. = placentæ from 5 Isin.

First dose, 5 c.c. by stomach tube, 11.30 a.m., 16.4.17.

Second „ 10 „ „ „ „ „ „ 17.4.17.

Result, no apparent ill effects.

Third series Experiments.—On the assumption that the native belief in the poisonous properties of the placentæ are correctly based, mixed extracts were used in this and succeeding series.

Placentæ from green-seeded unripe fruits were boiled with arilli from (a) green-seeded unripe (b) black-seeded unripe (c) ripe (d) over-ripe fruits.

The placentæ for each extract were obtained from 10 fruits and arilli from other 10 fruits in each case, that is, each extract was made from the parts of 20 fruits.

EXTRACT No. 10.—Placentæ from 10 green-seeded unripe Isin.

Arilli from other 10 green-seeded unripe Isin.

Dog I, as before.

Concentration of extract, 10 c.c. = $\left\{ \begin{array}{l} \text{placentæ from 5 Isin.} \\ \text{arilli from other 5 Isin.} \end{array} \right.$

First dose, 10 c.c. by stomach tube, 11 a.m., 19.4.17.

Second „ 10 „ „ „ „ 2.30 p.m. 19.4.17.

Result, no apparent ill effects.

EXTRACT No. 11.—Placentæ from 10 green-seeded unripe Isin.

Arilli from 10 black-seeded unripe Isin.

Dog II, as before.

Concentration of extract, 10 c.c. = $\left\{ \begin{array}{l} \text{placentæ from 5 Isin.} \\ \text{arilli from 5 Isin.} \end{array} \right.$

First dose, 10 c.c. by stomach tube, 11 a.m., 19.4.17.

Second „ 10 „ „ „ „ 2.30 p.m., 19.4.17.

Result, animal found dead 7 a.m., 20.4.17. No signs of illness had been observed during 19.4.17 up till 8 p.m. Thereafter the dog was not under observation until 7 a.m. of 20.4.17 when the body was still warm and without rigor mortis. There were no signs of vomiting in the cage.

Post-mortem, there were no signs of gastric irritation. The liver was of a yellowish brown colour, and oozed profusely with blood, on section. The kidneys were swollen and congested.

Smears from the heart blood and the spleen were negative.

Fatty cells were noted in the smears from the liver and kidney.

Stained sections of organs.—The liver showed considerable general engorgement of the blood-vessels and small hæmorrhages into the substance here and there. The nuclear staining was poor. Fatty degeneration was advanced and evenly distributed, practically all the hepatic cells showing this change. The kidney showed all the signs of an acute nephritis with some fatty degeneration in the lining cells of the convoluted tubules.

The spleen showed some engorgement.

The pathological changes in these three organs corresponded very closely with those described and figured by Scott (3).

EXTRACT No. 12.—Placentæ from 10 green-seeded unripe Isin.

Arilli from 10 ripe Isin.

Dog III, as before.

Concentration of extract, 15 c.c. = $\left\{ \begin{array}{l} \text{placentæ from 5 Isin.} \\ \text{arilli from 5 Isin.} \end{array} \right.$

First dose, 15 c.c. by stomach tube, 11.30 a.m., 19.4.17.

Second „ 15 „ „ „ „ 3 p.m., 19.4.17.

Result, no apparent ill effects.

EXTRACT No. 13.—Placentæ from 10 green-seeded unripe Isin.

Arilli from 10 over-ripe Isin.

Dog VI. Weight, 1,020 grammes.

Concentration of extract, 15 c.c. = $\left\{ \begin{array}{l} \text{placentæ from 5 Isin.} \\ \text{arilli from 5 Isin.} \end{array} \right.$

First dose, 9 c.c. by stomach tube, 11 a.m., 25.4.17.

Second „ 15 „ „ „ „ 11 „ 26.4.17.

Result, no apparent ill effects.

Fourth series of Experiments.—Placentæ from over-ripe fruits were chosen for boiling with the arilli of the four selected stages.

EXTRACT No. 14,—Placentæ from 10 over-ripe Isin.

Arilli from other 10 over-ripe Isin.

Dog I, as before.

Concentration of extract, 15 c.c. = $\left\{ \begin{array}{l} \text{placentæ of 5 Isin.} \\ \text{arilli of 5 Isin.} \end{array} \right.$

First dose, 15 c.c. by stomach tube, 11 a.m., 22.4.17.

Second „ 15 „ „ „ „ 3 p.m., „

Result, no apparent ill effects.

EXTRACT No. 15.—Placentæ from 10 over-ripe Isin.

Arilli from 10 green-seeded unripe Isin.

Dog III, as before.

Concentration of extract, 15 c.c. = $\left\{ \begin{array}{l} \text{placentæ of 5 Isin.} \\ \text{arilli of 5 Isin.} \end{array} \right.$

First dose, 15 c.c. by stomach tube, 11 a.m., 22.4.17.

Second dose, 15 c.c. by stomach tube, 3 p.m., 22.4.17.

Result, animal died 8 a.m., 24.4.17.

This dog took his food and appeared to be in good health until within half-an-hour of death. No convulsions, no coma, no lethargy, no vomiting were observed.

There was sudden collapse, and spasmodic twitchings were noted only in the agonal state.

Post-mortem, the only macroscopical abnormalities were a few linear ecchymotic areas in the gastric mucous membrane, a brownish-yellow appearance of the liver and a swollen congested condition of the kidneys.

Microscopically, the pathological changes in the liver and the kidney were similar to those observed in Dog II except that the inflammatory reaction in the kidney was more advanced.

EXTRACT No. 16.—Placentæ from 10 over-ripe Isin.

Arilli from 10 black-seeded unripe Isin.

Dog V, as before.

Concentration of Extract, 15 c.c. = $\left\{ \begin{array}{l} \text{Placentæ from 5 Isin.} \\ \text{Arilli from 5 Isin.} \end{array} \right.$

First dose, 15 c.c. by stomach tube, 11.30 a.m., 22.4.17.

Second dose, 15, c.c. by stomach tube, 3.30 p.m., 22.4.17.

Result, animal died 10 am., 24.4.17.

As with Dog III, no signs of illness were detected until within half-an-hour of death, when general twitchings and occasional tetanus-like movements were observed.

At the post-mortem examination, a brownish-yellow colour of the liver, and a congested kidney were noted.

Histologically, the cell changes corresponded to those found in Dogs II and III, but there were also small hæmorrhages in the spleen.

EXTRACT No. 17.—Placentæ from 10 over-ripe Isin.

Arilli from 10 ripe Isin.

Dog V, as before.

Concentration of Extract 18 c.c. = $\left\{ \begin{array}{l} \text{Placentæ of 3 Isin.} \\ \text{Arilli of 3 Isin.} \end{array} \right.$

First dose, 18 c.c. by stomach tube, 11.30 a.m., 22.4.17.

Second dose, 18 c.c. by stomach tube, 3.30 p.m., 22.4.17.

Result, no apparent ill effects.

Fifth series of Experiments.—This series was a repetition of the third and fourth series, except that placentæ from black-seeded unripe fruits were used.

Details are given in Table V.

EXTRACT No. 18—Placentæ from 10 black-seeded unripe Isin.

Arilli from 10 green-seeded unripe Isin.

Dog VIII. Weight, 2,160 grammes.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c. by stomach tube, 10 a.m., 28.4.17.

Result, no apparent ill effects.

EXTRACT No. 19.—Placentæ from 10 black-seeded unripe fruits.

Arilli from 10 black-seeded unripe fruits.

Dog VI, as before.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c. by stomach tube, 10 a.m., 28.4.17.

Result, no apparent ill effects.

EXTRACT No. 20.—Placentæ from 10 black-seeded unripe Isin.

Arilli from 10 ripe Isin.

Dog VII. Weight 1,020 grammes.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c., by stomach tube, 10.20 a.m., 28.4.17.

Result, no apparent ill-effects.

EXTRACT No. 21.—Placentæ from 10 black-seeded unripe Isin.

Arilli from 10 over-ripe Isin.

Dog I, as before.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c. by stomach tube, 10.30 a.m., 28.4.17.

Result, no apparent ill-effects.

Sixth series of Experiments.—The extracts used in this series were the same as in the fourth series except that the placentæ were not only over-ripe, they had been allowed to turn soft and nearly black. They have therefore been termed “decayed” to distinguish them from the “over-ripe” of the fourth series.

EXTRACT No. 22.—Placentæ from 5 decayed Isin.

Arilli from 5 decayed Isin.

Dog 1, as before.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c. by stomach tube, 10 a.m., 1.5.17.

Result: Animal died 9 a.m., 2.5.17. As with Dogs III and IV, no signs of illness were observed until there was sudden collapse with general convulsions about half-an-hour before death. Post-mortem, a few streaks of altered blood were seen, adhering to the gastric mucous membrane, and the liver and kidneys were congested, the former being of a yellowish-brown colour. Microscopically, the pathological changes were similar to those found in Dogs II, III and IV.

EXTRACT No. 23.—Placentæ from 5 decayed Isin.

Arilli from 5 ripe Isin.

Dog VIII, as before.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c. by stomach tube, 10 a.m., 1.5.17.

Result, no apparent ill-effects.

EXTRACT No. 24.—Placentæ from 5 decayed Isin.

Arilli from 5 black-seeded unripe Isin.

Dog IX. Weight, 2.135 grammes.

Concentration of Extract, 6 c.c. = $\begin{cases} \text{Placentæ of 1 Isin.} \\ \text{Arilli of 1 Isin.} \end{cases}$

Dose, 30 c.c. by stomach tube, 10.30 a.m., 1.5.17.

Result, no apparent ill-effects.

EXTRACT No. 25.—Placentæ from 5 decayed Isin.

Arilli from 5 green-seeded unripe Isin.

Dog VII, as before.

Dose, 30 c.c. by stomach tube, 10 a.m., 8.5.17.

Result, no apparent ill-effects.

Seventh series of Experiments.—The extracts used here were repeats of extracts previously used.

EXTRACT No. 11a, a repeat of No. 11.—

Placentæ from 10 green-seeded unripe Isin.

Arilli from 10 black-seeded unripe Isin.

Dog VI, as before.

Concentration of Extract 15, c.c. = $\begin{cases} \text{Placentæ of 5 Isin.} \\ \text{Arilli of 5 Isin.} \end{cases}$

First dose, 15 c.c. by stomach tube, 10 a.m., 3.5.17.

Second dose, 15 c.c. by stomach tube, 2.30 p.m., 3.5.17.

Result, animal died 9 a.m., 4.5.17, under the circumstances described for Dogs II, III and IV.

Macroscopically, the post-mortem findings also were the same, except that there were numerous petechiæ on the serous surfaces. Histologically, the inflammatory changes, with fatty degeneration previously described, were present in the liver and kidney.

EXTRACT No. 14a, a repeat of No. 14 except that arilli and placentæ from the same fruits were used and the parts were decaying. It was also the same as No. 22.

Placentæ and arilli from 10 over-ripe Isin.

Dog I, as before.

Concentration of Extract 30 c.c. = Placentæ and arilli of 5 Isin.

First dose, 30 c.c. by stomach tube, 10 a.m., 25.4.17.

Second dose, 30 c.c. by stomach tube, 10 a.m., 26.4.17.

Result, no apparent ill-effects.

EXTRACT No. 15a, a repeat of Nos. 15 and 25 and only differing from the former in that the placentæ were distinctly decayed.

Placentæ from 10 decayed Isin.

Arilli from 10 green-seeded unripe Isin.

Dog VIII, as before.

Concentration of Extract, 15 c.c. = $\left\{ \begin{array}{l} \text{Placentæ of 5 Isin.} \\ \text{Arilli of 5 Isin.} \end{array} \right.$

First dose, 15 c.c. by stomach tube, 10 a.m., 3.5.17.

Second dose, 15 c.c. by stomach tube, 2.30 p.m., 3.5.17.

Result, animal died 6.30 p.m., 4.5.17.

There were obvious signs of illness for about 8 hours previous to death. The animal was weak and tremulous and refused food, but no vomiting or convulsions were observed. Post-mortem, the macroscopic and microscopic appearances were as already described.

EXTRACT No. 16a, a repeat of Nos. 16 and 24 and only differing from the former in that the placentæ used were distinctly decayed.

Placentæ from 10 decayed Isin.

Arilli from 10 black-seeded unripe Isin.

Dog IX, as before.

Concentration of Extract, 15 c.c. = $\left\{ \begin{array}{l} \text{Placentæ of 5 Isin.} \\ \text{Arilli of 5 Isin.} \end{array} \right.$

First dose, 12 c.c. by stomach tube, 10.30 a.m., 3.9.17.

Second dose, 15 c.c. by stomach tube, 3 p.m., 3.9.17.

Result, no apparent ill-effects.

EXTRACT No. 22a, a repeat of No. 22.

Placentæ from 10 decayed Isin

Arilli from 10 decayed Isin.

Dog IX, as before.

Concentration of Extract, 30 c.c. = $\left\{ \begin{array}{l} \text{Placentæ of 5 Isin.} \\ \text{Arilli of 5 Isin.} \end{array} \right.$

Dose, 30 c.c. by stomach tube, 10 a.m., 8.5.17.

Result, no apparent ill-effects.

EXTRACT No. 11b. A repeat of Nos. 11 and 11a.

Placentæ from 10 green-seeded unripe Isin.

Arilli from 10 black-seeded unripe Isin.

Dog VII, as before.

Concentration of Extract, 15 c.c. = $\left\{ \begin{array}{l} \text{Placentæ of 5 Isin.} \\ \text{Arilli of 5 Isin.} \end{array} \right.$

First dose, 15 c.c. by stomach tube, 9 a.m., 12.5.17.

Second dose, 15 c.c. by stomach tube, 1 p.m., 12.5.17.

Result, animal died 7 a.m. Post-mortem, there was some congestion of the gastric mucous membrane in the region of the œsophageal orifice. The liver was brownish yellow in colour. The small intestine was choked with Taeniæ. Histologically, there were the same changes in the liver and kidney as have been described.

Six puppies, at or about the same age and weight as the experimental animals, were kept as controls, sharing the same kind of food and the separate confinement in cages. None of these control animals died, or showed any signs of illness.

SUMMARY.

(1) It would appear that Placentæ alone, Arilli alone and Husks alone, from the fruit of *Blighia sapida* in Nigeria, made into an infusion with boiling water, are non-poisonous to native puppies.

In the case of Placentæ, the infusion can be administered in considerable strength, without causing obvious ill-effects.

(2) Mixed extracts, *i.e.* prepared from Placentæ and Arilli boiled together caused the death of the puppies in the following instances:—

- (a) Extract No. 11, consisting of placentæ from green-seeded unripe fruits and arilli from black-seeded unripe fruits, in two doses, each equalling the soluble watery extracts of the parts from 5 fruits, caused the death of Dog II within 24 hours. The result was confirmed with Dogs VI and VII. The liver and the kidney showed the characteristic changes, due to "Vomiting Sickness" as described by Scott.
- (b) Extract No. 15, consisting of placentæ from over-ripe fruits and arilli from green-seeded unripe fruits, in two doses each equalling the soluble extracts of the parts from 5 fruits caused the death of Dog III within 41 hours. The result was confirmed with Dog VIII, the death occurring within 16 hours.
- (c) Extract No. 16 prepared from placentæ separated from over-ripe fruits and arilli from black-seeded unripe fruits, in a dosage similar to that in (b) caused the death of Dog IV within 43 hours. The result was not confirmed with Dog IX which showed no ill-effects after similar treatment.
- (d) No fatal results were obtained, using extracts made from black-seeded unripe placentæ and arilli from the two unripe, the ripe and the over-ripe stage of the fruit.
- (e) Using decayed placentæ, obtained from fruits which had ripened on a broken bough, and had proceeded to decay, a fatal result was obtained in Dog I, by the use of Extract No. 22 prepared from decayed placentæ and decayed arilli. A single dose, representing the soluble watery extracts of the parts from 5 fruits, caused death within 24 hours. This result was not confirmed in the case of Dog IX, which received similar treatment.
- (f) Collapse was sudden, and no signs of illness were detected until within half-an-hour of death in any of the animals except Dog VIII which was obviously ill for about 8 hours before death.

Vomiting was not observed in any of the cases. Convulsions only set in during the last few minutes of life.

REFERENCES:—

- (1) "The Vomiting Sickness of Jamaica," H. Harold Scott. *Trans. Soc. Trop. Med. and Hyg.*, 1917, January. Vol. 10, No. 3, pp. 47-62;
- (2) "Ackee" J. M. Dalziel. *Lancet*. No. 4,848, Vol. CXCI (No. V of Vol. II, 1916) July 29, p. 215.
- (3) "On the 'Vomiting Sickness' of Jamaica," H. Harold Scott. *Ann. Trop. Med. and Paras.*, Vol. X, No. I, April, 1916, pp. 1-78.

LEPROSY.

Four methods of treatment have been given an extended trial at the Yaba Leper Asylum.

- (1) Chaulmoogra oil. This has been in constant use.
- (2) Nastin. Dr. Beale-Browne and Dr. Macpherson applied this preparation over a period of four years.
- (3) Heiser's combination of Chaulmoogra oil with Camphorated oil and Resorcin, was given to certain cases from May, 1916, until June, 1917.

Dr. Coghill published a description of these. (*Annals Tropical Medicine and Parasitology* vol., xi No. 2, August, 1917.) (See also Annual Report, Medical Research Institute, 1916).

- (4) Gynocardate of Soda. The latter half of the year 1917 was devoted to a trial of this drug.

It is difficult to reach a true estimate of the value of any one drug in the treatment of Leprosy. A perusal of the Asylum case books leaves the impression that none of the four named methods of treatment is specific. Relapses have occurred in treated and untreated cases. Definite improvement has been noted in the entire absence of drug administration. The negro leper is prone to alternating optimism and pessimism. He eagerly welcomes a new therapeutic measure and tends to exaggerate any beneficial results, but despondency sets in sooner or later when he may refuse further dosage.

A short history of twenty patients will suffice to demonstrate the results, beneficial or otherwise, of the various forms of treatment.

Case A.D.—Male. Age 28 years. Admitted, May, 1910.

Duration of disease, 5 years.

On admission.—Numerous maculae.

Mutilation of digits.

Anaesthesia, both feet.

Nastin, administered at weekly intervals from December, 1910, until August, 1911, caused lessening in size and number of maculae.

Chaulmoogra oil, twice daily, was prescribed in August, 1913, when the anaesthetic macular areas had again increased in size and number.

A *native ointment* (which consisted of cashew nut, ground to powder and mixed with carbolic acid and shea butter) applied to the maculae, in October, 1913, caused deep ulceration. When healing was completed, there was returned sensation to the areas. At this time there was anaesthesia of the right arm, from the elbow downwards, and of both legs from the knee downwards.

Until April, 1914, when the patient decamped, there was no further development of the disease, under the administration of Chaulmoogra oil.

Case A.L.—Male. Age 30 years. Admitted, January, 1911.

Duration of disease, one year.

On admission.—Maculae on face, chest, arms and legs.

Nastin, administered from January, 1911, until December, 1913.

In August, 1913, the maculae were disappearing.

In November, 1913, the only remaining maculae were two or three on the face and neck.

He was discharged on 28th May, 1914, no maculae, no anaesthesia and no *B. leprae* in the posterior nares. (Compare with Case B.W. later).

Case A.K. (No. 5, Report, 1916).—Male. Age 45 years. Admitted, May, 1909.

Duration of disease, "since a boy."

On admission.—"Main en griffe" and anaesthesia left hand.

Left foot, all toes absorbed, anaesthesia.

Right foot, extensive ulceration on sole.

Nastin was administered from September, 1909, until December, 1913.

In December, 1910, he could move the fingers of the left hand. Sensation had returned to the left foot.

In August, 1913, there were maculae on the trunk, arms and neck. There was a small ulcer on the left sole and the ulcer on the right sole had healed.

In December, 1913, the maculae had disappeared.

In January, 1914, there were three small ulcers on the left sole.

Chaulmoogra oil was prescribed at this time.

In July, 1914, there were no ulcers.

In May, 1916, there was anaesthesia in the left arm and both legs. There was a large ulcer on the left sole. The left ulnar and both peroneal nerves were thickened.

Heiser's treatment was begun at this time.

At the end of December, 1916, only the left foot was anaesthetic and the ulcer had healed.

Gynocardate of Soda was substituted in June, 1917, in $\frac{1}{10}$ grain doses, given intravenously, once a week, and increasing weekly by $\frac{1}{10}$ grain up to 3 grains.

At the end of December, 1917, there was anaesthesia from both elbows downwards, and from both knees downwards. There were no nerve thickenings. There was an ulcer at the back of the right elbow.

No *B. leprae* found in a smear from the nose.

Case B.K.—Male. Age 43 years. Admitted, August, 1901.

Duration of disease, eighteen years.

On admission, ulceration and deformity of toes of both feet.

Chaulmoogra oil was given from 1901 until 1909, during which time ulcers appeared, healed and re-appeared on both hands and feet.

Nastin was administered from September, 1909, until December, 1910, and again from July until November, 1911.

In August, 1913, *Chaulmoogra* oil replaced the *Nastin* treatment. At this time there were maculae on the trunk, and an ulcer on the right foot.

In November, 1913, the maculae had faded and the ulcer had healed.

Treatment was suspended in January 1914.

In March, 1914, an ulcer developed on the right sole.

This was healed in June, 1914.

In July, 1914, the old ulcer on the right sole re-appeared and there was impairment of sensation in both legs.

Heiser's treatment was started in September, 1916.

At this time there was anaesthesia in both arms and legs. There was a large ulcer on the right sole. Both ulnar and both peroneal nerves were thickened.

At the end of December, 1916, there was some return of sensation to the right arm and both legs. The ulcer was healing.

Gynocardate of Soda was begun in June, 1917.

At the end of December, 1917, sensation was complete in both legs but both hands were anaesthetic. The ulcer was not quite healed.

There were no nerve-thickenings and no maculae. No *B. leprae* were found in a smear from the posterior nares.

Case B.O.—Male. Age 36 years. Admitted, February, 1912.

Duration of disease, "Some years."

On admission.—Mutilation of all digits. "Main en griffe" both hands. Ulcers on right big toe.
Maculae on trunk and arms.

Nastin was given from February, 1912, until July, 1913.

In September, 1913, there were ulcers on both feet. The maculae were less prominent.

Chaulmoogra oil was then substituted. From then, until September, 1916, ulcers appeared, healed and appeared again, and sensation became impaired in the hands.

Heiser's treatment was given from September, 1916, until June, 1917, when *Gynocardate of Soda* was administered.

At the end of 1917, sensation was complete, there were no ulcers, and no maculae. No *B. leprae* were found in a smear from the posterior nares.

Case D.A. (No. 1, Report, 1916).—Male. Age 38 years. Admitted, February, 1912.

Duration of disease, 5 years.

On admission, Leonine expression.

Nodules and thickening of skin.

Nastin was administered from February, 1912, until May, 1913.

On 31st August, 1913, there were more numerous nodules on face, ears and nose.

Chaulmoogra oil was substituted on 21st October, 1913.

In January, 1914, there were ulcers on the right, middle and index fingers.

These were healed on 5th February, 1914.

On 1st June, 1914, anaesthesia of right foot and ankle was noted.

Heiser's treatment was begun on 19th May, 1916,

On this day the condition was as follows :—

Face leonine. Skin thickened and of a yellowish colour. Many nodules on face, nose, ears and lips. Anaesthesia left forearm and thumb, right forearm, middle and ring fingers, and both legs from below the knee. Both ulnar nerves thickened. Maculae on hands and legs. Both feet and ankles cedematous.

At the end of 1916, the nodules had diminished in size and the skin was less thickened. Some of the maculae had disappeared and there was some return of sensation.

Gynocardate of Soda was substituted in May, 1917.

At the end of 1917, sensation was complete except in the legs. There were no maculae and no ulcers. There was slight oedema of the left foot. The nodules were hardly perceptible, and the skin generally was soft, glistening and finely wrinkled. There was no thickening of the ulnar nerves. No *B. leprae* were found in a smear from the posterior nares.

Case L.A. (No. 2, Report, 1916).—Male. Age 21 years. Admitted, November, 1911.

Duration of disease, four months.

On admission.—Nodules on face and forehead.

Maculae on trunk.

Nastin was administered from November, 1911, until December, 1913.

On 1st September, 1913, the nodules had almost entirely disappeared, and only a few maculae remained.

On 27th November, 1913, there was some anaesthesia of both ankles and feet.

On 19th May, 1916, the leonine expression was present.

There were nodules on ears, checks, chin, lips and forehead.

There was anaesthesia of both forearms and hands, and of both legs from half way below the knees.

Both ulnar and both peroneal nerves were thickened.

Numerous maculae were present.

Both feet and ankles were oedematous.

Heiser's treatment was begun on this day.

At the end of 1916, the leonine expression was hardly noticeable, there was considerable absorption of the nodules, and the maculae had disappeared. The anaesthetic areas on the arms had lessened in size.

Gynocardate of Soda was substituted on 15th June, 1917.

At the end of 1917, the condition was

Sensation complete.

No maculae. No nodules.

Some thickening of skin of face.

Some oedema of hands and feet.

Few *B. leprae* in posterior nares.

Case S.H. (No. 3 in Report, 1916).—Male. Age 40 years. Admitted, September, 1905.

Duration of disease, 13 years.

On admission.—Several maculae.

Anaesthesia of right arm and right leg.

Mutilation of all digits.

Ulcers on right hand and right foot.

Nastin was given from December, 1910, until July, 1913.

In September, 1913, the maculae had disappeared.

Chaulmoogra oil was administered from 21st October, 1913.

On 24th March, 1914, there was anaesthesia in both legs. There was a small ulcer on the right foot.

Heiser's treatment was begun in May, 1916, at which time there were :—

Anaesthesia both arms, from elbow downwards.

Both legs from knee downwards.

Both popliteal and ulnar nerves thickened.

Numerous maculae.

At the end of 1916, a few maculae were present on the abdomen only. There was some return of sensation particularly in the left arm.

Gynocardate was given in June, 1917.

At the end of 1917, sensation was complete in the left leg and as far as the wrists in both arms. There were no ulcers, no maculae and no nerve-thickenings. No *B. leprae* were found in smear from the posterior nares.

Case O. G.—Male. Age 30 years. Admitted, May, 1909.

Duration of disease, 12 years.

On admission.—Maculae on trunk.

Active mutilation of digits.

Nastin injected from July, 1911, until July, 1913.

In September, 1913, there were still maculae and there were ulcers on the fingers and toes.

Chaulmoogra oil was prescribed on 8th September, 1913.

On 27th July, 1914, there was a small ulcer under the right big toe. The maculae were fading.

On 30th January, 1917, the condition was :—

Maculae on face, head and neck.

Anaesthesia both forearms and hands, and both legs from below the knee.

Considerable deformity of all digits.

Ulcers, two on outer aspect left forearm, two on anterior aspect right leg.

B. leprae in posterior nares.

Heiser's treatment begun.

24th July, 1917, *Gynocardate* substituted.

At the end of 1917, the maculae were fainter and smaller.

Sensation was complete except in the feet.

Ulcers healed except a recent minute one on right heel.

No *B. leprae* found in smear from posterior nares.

Case O. J. (No. 4 in Report, 1916).—Male. Age 30 years.

Admitted, October 1913.

Duration of disease, 4 years.

On admission, maculae on face, neck and chest.

Deformity of digits.

An ulcer in front of tibia.

By 27th November, 1913, under carbolic dressings, the ulcer was healed, as were also several small ulcers which had appeared on the stumps of the fingers.

Chaulmoogra oil prescribed on 1st January, 1914.

Heiser's treatment substituted on 17th May, 1916, on which date the condition was: anaesthesia both arms from elbow, right leg from ankle, and left leg from knee, downwards. Both ulnar and peroneal nerves thickened. Ulcers at base of left middle and little fingers.

At the end of 1916, sensation was complete in the right leg and also in the right arm as far as the wrist. The ulcers were healed.

Gynocardate of Soda substituted 24th July, 1917.

This drug was given intravenously once per week. The initial dose was $\frac{1}{10}$ grain. On 16th September, 1917, at which date the dose was $\frac{8}{10}$ grain, the treatment was stopped on account of the development

of ascites and oedema of scrotum, legs and hands. The patient died from this Nephritis on 28th December, 1917. Since admission in 1913, he had manifested, at various times, oedema of the legs and scrotum and puffiness of the face.

Possibly the Gynocardate was responsible for lighting up the chronic Nephritis.

Case O. M. (No. 7 in Report, 1916).—Female. Age 40 years. Admitted, August, 1897.

Duration of disease, four years.

On admission.—Maculae on both arms, pain and swelling, left foot.

Chaulmoogra oil prescribed in 1902. During the previous five years, ulceration and absorption of digits had proceeded.

Nastin was given from 12th December, 1910, until August, 1912.

Chaulmoogra oil was again given in September, 1913. At this time, all the digits were mutilated and there was a large ulcer on the left sole.

Heiser's treatment was begun on 28th September, 1916.

There was then anaesthesia in both arms and in the left leg. Both ulnar nerves thickened. Maculae on upper arms. Two large ulcers on left sole.

At the end of 1916 the maculae had gone.

The anaesthesia was confined to both hands and the left leg from below the knee. One of the ulcers on the left sole had completely healed.

Gynocardate was given on 15th June, 1917. At the end of 1917, sensation was complete, but the healed ulcer on the sole had slightly broken down and the other ulcer remained.

No *B. leprae* found in a smear from the nose.

Case P. A.—Male. Age 29 years. Admitted, June, 1903.

Duration of disease, 10 years.

On admission.—Opacity of cornea, almost blind.

Ulcers on cheeks.

Third right and second left toe absorbed.

Chaulmoogra oil prescribed in 1903.

In January, 1910, all digits mutilated.

Totally blind.

Anaesthesia both arms from elbow.

„ „ legs „ knee.

Ulcer on right foot.

Nastin treatment was then begun.

In September, 1913, *Chaulmoogra oil* was given in addition to the *Nastin*.

In November, 1913, the anaesthesia was limited to the hands and feet.

No ulcers. *Nastin* and *Chaulmoogra oil* stopped at end of 1913.

Heiser's treatment was started in May, 1916.

At that time, there was anaesthesia in left shoulder, forearm and hand, right hand, and both legs from middle of thigh. Both ulnar nerves thickened. Maculae on chest and back.

At the end of 1916, there was some return of sensation particularly in the left arm. The maculae were fading.

Gynocardate was prescribed in July, 1917. At the end of 1917, there were no ulcers, no maculae, no nerve thickenings, and sensation was complete except in the feet. No *B. leprae* found in a smear from the posterior nares.

Case I. S.—Male. Age 45 years. Admitted, January, 1915.

Duration of disease, 16 years.

On admission.—Blind in right eye.

Numerous maculae.

Mutilation of toes.

Gynocardate prescribed in August, 1917.

At the end of 1917, there were no ulcers, no maculae, no anaesthesia, no further mutilation.

No *B. leprae* were found in a smear from the nose.

Case A.D.—Male. Age 40 years. Admitted, August, 1912.

Duration of disease, 12 years.

On admission.—Leonine countenance. Considerable mutilation of toes.

On 31st July, 1917, there were ulcers on both heels, left arm swollen and eczematous.

Gynocardate prescribed on this date.

At the end of 1917, the ulcers were healed, left arm normal, no further mutilation, no anaesthesia.

No *B. leprae* were found in a smear from the nose.

Case L.M.—Male. Age 35 years. Admitted, July, 1911.

Duration of disease, one year.

On admission.—Leonine countenance. Maculae on trunk.

In December, 1915, there were numerous raised erythematous patches, generally distributed. *Gynocardate* prescribed in August, 1917, when the erythematous patches had increased.

At the end of 1917, the patches were less raised and less extensive and there were no additional signs of leprosy. No *B. leprae* were found in a smear from the nose.

Case B.W. (No. 6, Report, 1916).—Male. Age 25 years. Admitted, April, 1916.

Duration of disease, two years.

On admission.—Maculae on face, scalp and neck.

Heiser's treatment prescribed in June, 1916.

At the end of 1916, there were two maculae left, one on the left cheek, the other on the occiput.

Gynocardate substituted in July, 1917.

On 13th September, 1917, his term of imprisonment expired.

There remained only the faint outline of a macule on the occiput.

No *B. leprae* were found in a smear from the posterior nares.

Case O.S.—Male. Age 50 years. Admitted, July, 1917.

Duration of disease, 15 years.

On admission.—“Main en griffe” both hands.

Considerable mutilation, all digits.

Ulcers on left hand, and right foot.

Anaesthesia forearms, hands and feet.

Maculae on chest.

Gynocardate prescribed in August, 1917.

At the end of 1917, sensation returned to forearm, ulcers on left hand and right foot healed, small ulcer on right hand and left foot. Fingers can be moved freely.

No *B. leprae* in a smear from the nose.

Case O.D.—Male. Age 40 years. Admitted, August, 1916.

Duration of disease, 16 years.

On admission.—Deformity of all digits.

Anaesthesia left arm, from elbow.

Gynocardate prescribed in July, 1917.

At the end of 1917, sensation was complete, no signs of active disease.

No *B. leprae* in smear from posterior nares.

Case A.E.—Male. Age 37 years. Admitted, May, 1916.

Duration of disease, 10 years.

On admission.—Mutilation of toes. Ulcers on both feet.

Gynocardate prescribed in August, 1917.

At the end of 1917, one small ulcer right foot. No *B. leprae* in smear from nose.

Case C.A.—Male. Age 35 years. Admitted, December, 1916.

Duration of disease, 6 months.

On admission.—Face leonine, Nodules on both ears. Maculae on trunk. Abundant *B. leprae* in nose.

Heiser's treatment begun in January, 1917.

Gynocardate substituted in July, 1917, when maculae more prominent and nodules larger.

At the end of 1917, the maculae were more numerous, the nodules were increased in size and number, there was "tingling" in both arms, and abundant *B. leprae* in nose.

Methods of treatment, Nos. 2, 3 and 4 were carried out, in each case, as recommended by Professor Deycke, Surgeon Heiser and Sir Leonard Rogers respectively.

EXAMINATION OF FÆCES.

Three hundred and fifteen samples of fæces have been examined. The results have been put in tabular form for economy's sake.

One hundred and seventy specimens came from Europeans, one hundred and twenty nine from Natives, and sixteen from Asiatics.

TABLE I.

	Europeans.	Natives.	Asiatics.	Total.
Trichuris ova	11	69	8	88
Ankylostome ova ... ..	...	60	2	62
Ascaris ova	1	56	3	60
Strongyloides ova	1	8	2	11
Taenia ova'... ..	...	3	2	5
Oxyuris ova ... ..	...	1	...	1
Cysts of <i>E. histolytica</i>	28	31	6	65
<i>E. histolytica</i>	28	6	...	34
Blastocystis	2	8	1	11
Tetramitus... ..	...	...	2	2
Balantidium ... ..	...	2	...	2
Cercomonas .. ..	...	1	...	1
Mucus only	7	1	1	9
Occult Blood (duodenal ulcer)... ..	1	...	...	1
Negative	94	19	2	115

The findings were obtained from the examination of one minute quantity (about the size of a lentil) from each stool. It is worthy of notice that only thirteen Europeans showed Helminth ova, and that in eleven of these, the parent was *Trichuris*. The non-finding of *Schistosoma* ova is satisfactory. The large proportion of negative results from the Europeans, as compared with the Natives denotes some

considerable hygienic appreciation amongst the former. The number of cases, in which the cysts of *Entamoeba histolytica* occurred in the stools, is large. In the bulk of such Europeans there was no history of a definite attack of Dysentery. Experience points to the entire efficacy of Emetine when properly administered early in an acute attack. The sequence of events in the above cases is usually, first an amoebiasis manifested as a diarrhoea, treated by non-specific methods or not at all, and a persistence of the infection in the form of cysts, which may resume the free amoeboid form and give rise to intestinal disturbance, or proceed to Liver Abscess. There is probably only one principal mode of transmission of any one Helminthic infection, but the means by which *Entamoeba histolytica* may reach the intestine are probably several, Osler's three F's., flies, food and fingers, being the most likely, so that prophylaxis is correspondingly more difficult. The life-history, mode of transmission and the pathological effects of the other intestinal protozoa are more obscure, but their occurrence in association with other parasites is interesting, and is shown in Table II.

TABLE II.

	Europeans.	Natives.	Asiatics.	Total.
Entamoeba histolytica, only	28	6	...	34
Cysts of E. " "	26	4	1	31
Trichuris ova " "	10	6	1	17
Trichuris, Ankylostome, Ascaris ova	14	1	15
Trichuris Ascaris ova	13	...	13
Trichuris, Ankylostome ova	10	...	10
Ankylostome ova only	9	...	9
Ascaris " "	1	7	1	9
Trichuris ova, Cysts of E. histolytica	1	4	5
Trichuris, Ankylostome, Ascaris ova, Cysts of E. histolytica	5	...	5
Ankylostome, Ascaris ova	4	...	4
Trichuris, Ankylostome, Ascaris, Strongy- loides ova	2	1	3
Ankylostome ova, Cysts of E. histolytica	3	...	3
Trichuris, Ankylostome ova, Cysts of E. hist.	...	3	...	3
Balantidium only	2	...	2
Trichuris ova, Cysts of E. hist., Blastocystis	...	2	...	2
Trichuris, Ankylostome, Ascaris ova, Cysts of E. hist., Blastocystis	2	...	2
Trichuris, Ankylostome ova, Cysts of E. hist., Blastocystis	2	...	2
Taenia ova only	1	1	2
Trichuris, Ankylostome, Strongyloides ova	2	...	2
" Ascaris ova, Cysts of E. hist.	2	...	2
" " " " " " " " " " " " " "	...	1	...	1
Trichuris, Ankylostome, Ascaris, Strongy- loides, Taenia ova	1	...	1
Trichuris ova, Cysts of E. hist., Blastocystis, Tetramitus.	1	1
Tetramitus only	1	1
Trichuris, Strongyloides ova, Cysts of E. hist.	...	1	...	1
Trichuris, Ascaris, Oxyuris ova " " "	...	1	...	1
Strongyloides, Taenia ova	1	1
Trichuris, Ascaris, Taenia ova, Cysts of E. hist.,	1	...	1
Strongyloides ova only	1	...	1
Ankylostome, Ascaris, Strongyloides ova, Cysts of E. hist.	1	...	1
Ankylostome, Ascaris ova, Cysts of E. hist.	...	1	...	1
Blastocystis only	1	...	...	1
Ankylostome, Ascaris ova, Cysts of E. hist., Blastocystis	1	...	1
Strongyloides ova, Cysts of E. hist.	1	...	...	1
Trichuris ova, Cysts E. hist., Blastocystis, Cercomonas	1	...	1
Total	67	110	13	190

EXAMINATION OF BLOOD SMEARS.

Two hundred and eleven blood smears were examined, from one hundred and seven Europeans, ninety-six natives and eight Asiatics.

A Differential Leucocyte count was made in sixty-seven of these.

No parasites or pigmented mononuclear cells were noted in eighty-nine Europeans, sixty-three natives and the eight Asiatics.

Subtertian malarial parasites occurred in thirteen Europeans, and in ten natives, the latter being children.

Quartan malarial parasites were observed in one European and in eight native children.

Trypanosomes (*T. gambiense*) were found in the blood of two Europeans and eight natives. Embryos of *Loa loa* occurred also in the blood of one of these Europeans, and Quartan malarial parasites in one of the natives.

Embryos of *Acanthocheilonema perstans* were seen in the blood of five natives.

Embryos of *Loa loa* occurred in the blood of one European already mentioned and in three natives.

Fifty-five blood smears from the lower animals were examined.

Trypanosomes were found in eleven oxen out of twenty-nine examined, in one horse out of two, and in one dog out of two.

Babesiæ were observed in four of the oxen.

The findings were negative, in the smears from six goats, five sheep and two pigs.

Hæmogregarines were found in the blood of one snake out of eight examined.

EXAMINATION OF URINE.

Thirty-one samples of urine were examined.

Pus cells and various organisms occurred in seven.

Six samples came from cases of Blackwater Fever.

A sugar estimation was made in five samples.

Tube casts were found, after centrifugalisation in four cases.

Schistosome ova were noted in two samples.

The findings were negative in seven instances.

EXAMINATION OF SPUTUM.

Twenty eight specimens of sputum were examined.

Tubercle bacilli were found in four cases (three natives and one European).

Abundant large Spirochaetes were observed in two natives.

Hepatic cells were noted in two cases of Liver Abscess which had ruptured into the lung.

The findings were not noteworthy in the remaining twenty cases.

EXAMINATION OF VARIOUS SMEARS.

Eleven smears from soft or hard sores were examined.

Treponema pallidum was not found in any.

Ten smears from urethral discharge all showed gonococci.

Four smears from the gums, in Pyorrhea were examined. Fusiform bacilli, Spirochaetes and amoebæ were observed in three, and fusiform bacilli and spirochaetes without amoebæ in one.

The other smears included specimens from the nose, the throat, lymphatic glands and various abscesses.

Samples of cerebrospinal fluid and inflammatory fluid from joints and serous cavities were also examined.

SERUM AGGLUTINATION.

Widal's test was made on forty-eight specimens of serum.

The reaction was positive to *Bacillus paratyphosus* A in seven cases, to *Bacillus typhosus* in six, to *Bacillus paratyphosus* B in five and to both *Bacillus typhosus* and *Bacillus paratyphosus* A in two cases.

HISTOLOGICAL EXAMINATIONS.

Twenty specimens of Liver were received. The conditions were Fatty Degeneration in eleven, Acute Hepatitis in six, Cloudy swelling in two and Malarial changes in one.

There were fifteen specimens of Kidney, showing Acute Nephritis in nine, cloudy swelling in three, Acute Congestion in two and Cirrhosis in one.

Fifteen specimens of Spleen were examined. There was Acute Congestion in thirteen, cirrhotic changes in one, and nothing noteworthy in the fifteenth.

Thirteen specimens of stomach, showed sub-mucous hæmorrhages or petechiæ in four, and nothing noteworthy in nine.

The specimens of Intestine numbered eight, the condition being Acute Amœbic Dysentery in two, tubercular ulceration in two and nothing noteworthy in the remaining four.

The other specimens included seven of Lung, five of Brain, five of Lymphatic Glands and one of Pancreas.

Fourteen specimens of tumour-tissue proved to be Sarcoma in nine, Epithelioma in two, Scirrhus Carcinoma in one, Simple Adenoma in one, and enormous Keloid growth in one.

Two specimens of Brain and Cord from dogs were examined in a search for Negri bodies, but with negative results.

SLAUGHTERHOUSE MATERIAL.

Dr. Dalziel sent numerous specimens for diagnosis but no attempt was made to examine histologically all the tissues which were received. Seventy specimens of Ox lung were examined. Tubercle bacilli were found in 13, and the condition was Acute Pleuro-pneumonia in nine. The remaining forty-eight were for the most part examples of bronchiectatic cavities, large abscesses or localised consolidated patches resulting from the insufflation of foreign bodies.

There were also ten specimens of acute Pleurisy.

Sixteen samples of Ox liver showed flukes in four, cysticerci in two, tubercle bacilli in one and non-tubercular abscesses or nodules in seven.

Enlarged lymphatic glands were received from five oxen, no tubercle bacilli or trypanosomes being found in them.

The udder from two cows showed acute inflammatory changes.

The remaining specimens from oxen were one case of purulent pericarditis, one sample of Brisket containing *Onchocerus*, a stomach containing *Ascaris* sp. and a *Myxosarcoma* from the groin.

Specimens from pigs numbered twenty-four. *Cysticerci* were present in five samples of liver and in one heart.

Stephanurus sp. were found in one specimen of liver, and encysted *Porocephalus* in another.

Two cases of acute Pleuro-pneumonia occurred.

There were nine specimens from sheep, including three specimens of acute Pleuro-pneumonia, two samples of liver infected with *cysticerci* and one liver with *Porocephalus*.

Three specimens of acute Pleuro-pneumonia were received from Goats.

Various medicinal or poisonous plants and powders were received from half-a-dozen stations.

Three adult specimens of *Loa loa*, obtained from the ocular conjunctivæ were received. They were all males.

Three specimens of *Tænia saginata* were also received.

Adult female *Strongyloides stercoralis* were found in the faeces of two natives.

BLACKWATER FEVER.

Notes on twenty-six cases of Blackwater Fever occurring in the Colony during 1917 have been received through the kindness of the Medical Officers in charge. Owing to various causes, many of them unavoidable, some of the reports were incomplete.

Such information as they contained is summarised herein.

There were 24 males and 2 females. The ages in 21 are 19 years (M); 22 (M); 23 (M); 26 (M) two; 27 (M), (two); 28 (M), (two); 29 (F); 30 (M); 31 (M); 33 (M); 34 (M); 35 (M); 37 (M), three; 42 (F); 47 (M); and 48 (M).

The nationality was British in 19, French 2, Italian 1, Greek 1, Syrian 1, Hindu 1, and West African negro one.

The cases occurred in Lagos (9), Kano (3), British Cameroons (3), Port Harcourt (2), Ibadan (1), Agbor (1), Emii (1), Omerum (1), Lokoja (1), Sokoto (1), Zungeru (1), Minna (1), Naraguta (1).

The months in which the cases occurred were February (2), March (1) April (2) May (1) June (2) (July) (4) August (1) September (2) October (5) November (1) and December five.

The total period of residence in West Africa was 10 years (2); 8 years (1); 5 years (2); 4 years (1); $3\frac{1}{2}$ years (1); 3 years (2); 19 months (1); and 12 months (one). The negro patient had lived the whole of his 19 years in Nigeria.

The length of the tour in which the disease was contracted was 5 years (2); $3\frac{1}{2}$ years (1); 3 years (1); 26 months (1); 19 months (1); 14 months (1); 12 months (1); 7 months (1); and $2\frac{1}{2}$ months (one).

Two patients are noted as having previously suffered on one occasion from Blackwater Fever.

There was a definite history of previous attacks of Malaria in 15 cases. This circumstance was not mentioned in the remaining eleven.

In only one case it is definitely stated that the patient was a regular Quinine-taker. The remaining patients were frankly careless of Quinine prophylaxis.

The particular salt of Quinine used in prophylaxis and in treatment was mentioned in six cases. It was the Bisulphate in five and the Bihydrochloride in one.

The dosage of Quinine which immediately preceded the attack varied considerably in the different cases. The Greek felt unwell on 11.2.17 and took 15 grains of the Bisulphate in one dose. Other ten grains were taken on the following day and 24 hours later hæmoglobinuria occurred. The elder of the two females took 10 grains of the Bisulphate on each of the two days previous to her attack, and a 15 grain dose on the third day was followed three hours later by the passing of "black water". The younger female took five grains of the Bisulphate twelve hours before the onset of the disease.

The Hindu took 15 grains (salt not stated) four hours before the appearance of the typical signs.

The Italian took 5 grains of the Bisulphate three hours before the attack. In another case the dose was 10 grains (salt not stated) and the interval was twelve hours. The "Syrian" passed black water two hours after a dose (amount not stated) of the Bisulphate.

The patient at Minna had 10 grains Quinine (salt not stated) at 5 p.m., 18.10.17, ditto 24 hours later, both by mouth and at 10 p.m., 19.10.17, 10 grains intramuscularly. Hæmoglobinuria occurred at 2 a.m., 20.10.17.

Premonitory signs, malaise and fever were present two or three days previously in 7 cases. The attack was sudden, the black water being the first indication, in two cases. The onset is undescribed in the remainder.

Jaundice is mentioned in 12 cases, present on the first day of hæmoglobinuria in 10, on the second day in one and on the third day in one.

Rigors are noted in seven patients. Vomiting occurred in eleven and was absent in one.

Hiccough, suppression of urine, and delirium characterised four of the six fatal cases. Death occurred in the remaining two, early in the attack, whilst hæmoglobinuria was present.

The duration of the hæmoglobinuria in the cases which recovered without relapse was 9 days (1); 6 days (1); 5 days (1); 4 days (4); two days (1); 36 hours (1); and 23 hours (one). Four cases recovered after relapse. In one, the total duration of hæmoglobinuria was 13 days, the primary attack lasting 3 days, the relapse two days, with an interval of 8 days. In the second case the total period was 10 days with four relapses, the duration of the first attack being 20 hours and of the relapses 17 hours, 11 hours, 2 hours, and 9 hours. The total period was 6 days in the third case the initial attack lasting 4 days and the relapse one day. The duration was 5 days in the fourth case with two relapses, one on the third and one on the fifth day.

Blood smears from five of the patients were examined at the Medical Research Institute. Dr. Hungerford sent specimens taken on the 2nd, 3rd and 6th days of hæmoglobinuria. Subtertian rings were present on the 2nd day, pigmented mononuclears on the 3rd day and normoblasts had made their appearance on the 6th day. The differential leucocyte counts were:—

	Poly-morph.	Small lymph.	Large lymph.	Mono-nuclear.	Eosino-phil.	Transi-tional.	Myelo-cytes.	Para-sites.	Pig-ment.	Normo-blasts.
2nd day ...	69·2	15	3·6	9·8	0·8	1·4	0·2	+	+	—
3rd day ...	71	13·2	4	7·4	...	4·1	0·4	—	+	—
6th day ...	63·6	18·4	3·6	9·2	0·2	4·4	0·2	—	—	0·4%

Mononuclear cells of endothelial origin included in the mononuclear percentage were 0·2% on the 2nd day, 0·8% on the 3rd and the same on the 6th day. Erythrophagocytic cells, that is mononuclear cells of endothelial origin containing phagocytosed red cells were 0·2% on the 3rd day but were not encountered in the other smears.

Dr. Watson sent smears taken on the 2nd, 3rd and 4th days of hæmoglobinuria. Subtertian rings were found on all 3 days, and were most numerous on the fourth.

Normoblasts appeared on the 3rd day and megaloblasts on the fourth. The differential leucocyte counts were:—

	Poly-morph.	Small lymph.	Large lymph.	Mono-nuclear.	Eosino-phil.	Transi-tional.	Mast cells.	Myelo-cytes.	Normo-blasts.	Megalo-blasts.	Para-sites.
2nd day	79·2	5·2	1·4	11·2	0·8	2·2	...	...	...	...	+
3rd day	62·4	10·4	3	19·4	0·6	2·8	1·6	0·6	0·2	...	+
4th day	50·8	21·6	4·2	15·4	2·6	3·4	8·0	0·6	0·2	0·4	+

Cells of endothelial origin, included in the mononuclear count were 0·8% on the 2nd, 0·6% on the 3rd and 0·8% on the fourth day.

The above two cases were of British birth.

Dr. Gray sent smears taken on the 2nd day of hæmoglobinuria in the case of a Greek. No parasites or pigmented mononuclears were noticed. The differential leucocyte count was:—

Poly-morph.	Small lymph.	Large lymph.	Mono-nuclear.	Transi-tional.	Mast cells.	Myelo-cytes.
78	7	2	10·6	1·6	0·2	0·6

The endothelial cells and the erythrophages (included in the mononuclear count) were 0·8 and 0·2% respectively.

Dr. Beale-Browne sent smears taken on the 2nd and 3rd days of hæmoglobinuria, in the case of a Hindu. No parasites and no pigmented mononuclear cells were observed. The differential leucocyte counts were:—

	Poly-morph.	Small lymph.	Large lymph.	Mono-nuclear.	Eosino-phil.	Transi-tional.	Myelo-cytes.
2nd day ...	67	12	1·6	12·4	0·2	5·2	1·6
3rd day ...	52·2	17·6	1·2	23·4	...	2·4	3·2

Vacuolated endothelial cells (included in the mononuclear count) were 0·6% on the 2nd and 1·2% on the 3rd day.

Dr. Parkinson sent smears taken on the 3rd day of hæmoglobinuria from one of his cases, of British nationality. No parasites and no pigmented mononuclear cells were noted. The differential leucocyte count was:—

Poly-morph.	Small lymph.	Large lymph.	Mono-nuclear.	Eosino-phil.	Transi-tional.	Mast cells.	Myelo-cytes.
69·8	15·2	2·4	4·8	0·4	2·4	0·4	4·6%

YELLOW FEVER.

In March, a case diagnosed as Yellow Fever occurred in a European on board ship in Lagos. Blood smears taken on 9th and 10th March from this case, showed numerous subtertian rings. The differential leucocyte counts were:—

	Poly-morph.	Small lymph.	Large lymph.	Mono-nuclear.	Transitional.	Mast cells.	Myelo-cytes.
9th day ...	79·2	5·4	1·8	11·8	1	0·6	0·2
10th day ...	83·6	5·6	0·4	6·4	2	1·2	0·8

A specimen of urine, received on 10th March, contained no tube casts.

In June, specimens were received from a native in Lagos, who was found dead. The stomach contained “coffee-grounds” material, and there were numerous sub-mucous hæmorrhages and petechiæ. The liver was in an advanced stage of fatty degeneration. The kidney was in a state of acute inflammation with hæmorrhages and some fatty change. There was hypostatic congestion of the lungs.

In October, blood serum was received from four Europeans at Ibi. These failed to agglutinate *Bacillus typhosus*, *Bacillus para-typhosus* A *Bacillus para-typhosus* B or *Micrococcus melitensis*. Material consisting of specimens of the liver, the spleen and the kidney and smears from the two former organs, were received for examination. They were obtained from a European lady who died at Ibi. No parasites or malarial pigment were observed in the smears. The liver tissue showed a condition of acute hepatitis with early fatty change, mostly in the middle zone of the lobules. The spleen was densely infiltrated by leucocytes. The kidney showed acute inflammatory changes, with hæmorrhages.

In November, sections of organs and some smears obtained from a male European, were received from Warri.

The smears were from the liver and the spleen. They showed no parasites and no malarial pigment. The liver showed extreme changes. The outline of the lobules was entirely lost, there were hæmorrhages and dense leucocytic invasion between the lobules, many of the hepatic cells were necrosed and there was general but unevenly distributed fatty degeneration. The kidney showed all the signs of acute nephritis with some fatty change. In the pancreas there was general cloudy swelling of the secretory cells; sections of the *cerebrum* and of the *cerebellum* showed great engorgement of the vessels. Sub-mucous hæmorrhages were present in the stomach.

MEDICAL ENTOMOLOGY.

A table is given, showing the larvæ identified, the receptacle in which they were found, and the other larvæ with which they were associated, arranged according to the months in which they were obtained.

The larvæ were received daily through the kindness of Dr. Dalziel, Medical Officer of Health, who instructed his Sanitary Inspectors to forward all specimens collected on their rounds. The information given in the table although it is not a complete record, is probably a very fair representation of the distribution of mosquito larvæ in Lagos. It will be noticed that *Stegomyia* is the most numerous and the most widespread, there being hardly a receptacle in which it was not found.

The total of 913 collections include larvæ of *Stegomyia fasciata*, *Culiciomyia nebulosa*, *Anopheles costalis*, *Culex decens*, *Ochlerotatus irritans*, *Uranotænia annulata*, *Stegomyia luteocephala*, *Ochlerotatus nigricephalus*, *Culex thalassius*; *Culex somaliensis*, *Anopheles funestus*,

Culex fatigans and *Culex duttoni*, in that order of frequency. It should be explained that a "Pot of Agbo" is a receptacle containing a decoction of leaves, roots, etc., used by the natives as medicine. It is a dark brown opaque fluid and its composition varies according to the ingredients. The only constant factors are the colour and the unpleasant strong smell.

Adult mosquitos obtained by the Medical Officer of Health himself in various residential quarters in Lagos were, in April, *Culex thalassius* and *Ochlerotatus irritans*, and in May, *Culex decens*, *C. duttoni*, *C. grahami*, *C. pruina*, *C. thalassius*, *Stegomyia fasciata*, *Ochlerotatus domesticus*, *O. irritans*, *O. nigricephalus*, *Anopheles costalis*, *Culiciomyia nebulosa*, *Mansonioides africanus*, and *Teniorrhynchus aurites*. In June, there were *Stegomyia fasciata*, *S. luteocephala*, *Anopheles costalis*, *Ochlerotatus domesticus*, *Culex thalassius*, *Culiciomyia nebulosa* and *Teniorrhynchus aurites*.

In July, there were *Culex decens*, *C. insignis*, *C. grahami*, *C. rima*, *Ochlerotatus irritans*, *O. nigricephalus*, *Culiciomyia nebulosa*, *Stegomyia luteocephala*, *Anopheles umbrosus* and *A. costalis*.

In August, there were *Culex tigripes*, *C. decens*, *C. thalassius*, *C. invidiosus*, *Ochlerotatus nigricephalus*, *O. irritans*, *Stegomyia fasciata* and *Culiciomyia nebulosa*.

In September, there were *Culex grahami*, *C. invidiosus*, *Anopheles umbrosus*, *Ochlerotatus nigricephalus* and *Culiciomyia nebulosa*.

In October, there were *Mansonioides africanus*, *Culiciomyia nebulosa*, *Anopheles costalis* and *Ochlerotatus caliginosus*.

Numerous collections of biting flies, from out-stations were received.

Dr. Grieve sent *Tabanus thoracicus*, *T. fasciatus*, *T. sharpi*, *Hippocentrum trimaculatum*, *Glossinapalpalis*, *Cordylobia anthropophaga*, and *Mansonioides africanus* from Ikom.

Dr. Braithwaite sent *Chrysops silacea*, *Tabanus taniola*, *Glossina palpalis*, *Culex tigripes*, *C. decens*, *C. duttoni*, *Culiciomyia nebulosa* and a *Ceratopogon* sp. from Abakaliki.

Dr. Collett sent *Tabanus secedens*, *T. socialis*, *T. thoracicus*, *T. par* and *Cordylobia anthropophaga* from Warri.

Dr. Beale-Browne sent *Tabanus argenteus*, and *Hippocentrum longicornis* from Victoria (British Cameroons).

Dr. Wilson sent *Tabanus secedens*, *T. combustus*, *Culex thalassius*, *C. trigripes*, *Anopheles costalis*, *Stegomyia africana* and *Culiciomyia nebulosa* from Brass.

Dr. Johnson sent *Anopheles wellcomei*, *A. nili*, *A. domicolus* and *A. flavicosta* collected on the river Benue between Ibi and Numan and also at Kaduna junction.

Dr. Watson sent sandflies from Lokoja.

Several large collections of mosquitoes were sent by Dr. Laurie, Senior Sanitary Officer, Sierra Leone, for identification. These were:—*Stegomyia fasciata* 713 ♀, 633 ♂, *S. luteocephala* 107 ♀ 53 ♂, *S. sugens*, 390 ♀ 199 ♂, *S. africana* 1 ♀ 4 ♂, *S. metallica* 1 ♂, *S. pseudonigeria* 5 ♀ 3 ♂, *Culex decens* 112 ♀ 155 ♂, *C. tigripes* 17 ♀ 6 ♂, *C. grahami* 4 ♀ 4 ♂, *C. duttoni* 65 ♀ 65 ♂, *C. thalassius* 39 ♀ 31 ♂, *C. invidiosus* 17 ♀ 8 ♂, *C. fatigans* 2 ♀, *Ochlerotatus apicoannulatus* 78 ♀ 54 ♂, *O. minutus* 13 ♀ 4 ♂, *O. domesticus* 3 ♀ 2 ♂, *O. marshalli* 2 ♀, *O. argenteopunctatus* 1 ♀, *Eretmopodites chrysogaster* 42 ♀ 37 ♂, *E. quinquevittatus* 28 ♀ 14 ♂, *E. oedipodius* 1 ♀ 5 ♂, *E. dracene* 1 ♀, *Anopheles costalis* 23 ♀ 25 ♂, *Toxorhynchites brevipalpis* 5 ♀ 1 ♂, *Ingramia malfeyti* 2 ♀, *Culiciomyia nebulosa* 641 ♀ 707 ♂.

Many specimens of *Chrysops* were dissected, in a search for *Filaria*.

Mr. Methven of Miller Brothers Rubber Plantation at Sapele sent large numbers of the fly, each month, preserved in spirit or formalin.

Dr. Smythe also sent a number of specimens from Sapele, as did Dr. Adam from Calabar and Dr. Grieve from Ikom. The investigation is still in progress and a few figures only are given.

Seven specimens of *Chrysops dimidiata* and three of *C. silacea*, collected in March were all negative. Forty-four *C. dimidiata* and eighty-seven *C. silacea*, were collected in April. Three specimens of *C. dimidiata* and two of *C. silacea* were infected. In May there were 287 *C. silacea*, and 30 *C. dimidiata*. One specimen of *C. silacea* was infected.

In June, there were 679 *C. silacea* (2 infected) and 25 *C. dimidiata* (one infected). In July, there were 567 *C. silacea* (six infected) and 41 *C. dimidiata* (none infected).

In August, there were 189 *C. silacea* (two infected) and 19 *C. dimidiata* (none infected). In September, there were 117 *C. silacea* (one infected) and 26 *C. dimidiata* (none infected). In October, there were 77 *C. silacea* (two infected) and 57 *C. dimidiata* (two infected).

Thus in nine months 2,282 specimens of *Chrysops* from Sapele, were dissected. This number was made up of 2,031 *C. silacea* and 252 *C. dimidiata*.

The number of infected *C. silacea* was 16 and of *C. dimidiata*, six.

Infected flies formed 0.96% of the total. *C. dimidiata* obtained in lesser number showed a higher percentage of infection (2.38%) than *C. silacea* which was 0.78 per cent.

Dr. Grieve sent 17 specimens of *C. silacea*, two of which were infected.

Dr. Adam sent 24 *C. silacea* and 7 *dimidiata*, none of which was infected.

The outstanding feature of the infected flies was the large number of *filaria*. They numbered several hundreds, as a rule, and were found in the abdominal and thoracic muscles and in the head, also in the root of the wings and in the *coxae*.

A number of other observations were made, but as all the material was preserved and hardened, and presumably somewhat altered, further notes are meanwhile withheld.

All the work of this section was performed by Mrs. Summers Connal.

Acknowledgement is gratefully accorded, for material supplied, to Dr. Adam, Dr. Ashton, Mr. Bargery, Dr. Beale-Browne, Dr. Beringer, Dr. Birt, Dr. Booth, Dr. Braithwaite, Dr. Lynch-Burgess, Dr. Clough, Dr. Cole, Dr. Collett, Dr. Craig, Dr. Dalziel, Dr. Digby, Mr. Farquharson, Dr. Ferguson, Dr. Foy, Dr. E. M. Franklin, Dr. Grieve, Dr. G. M. Gray, Dr. Gordon Hall, Dr. Hungerford, Dr. W. B. Johnson, Dr. J. E. L. Johnston, Dr. Laurie, Dr. Maples, Dr. Maclaine, Dr. Macfarlane, Dr. McKay, Dr. McKinney, Mr. Methven, Dr. Moiser, Dr. Jackson Moore, Dr. Neale, Dr. Norman, Dr. O'Keeffe, Dr. Oluwole, Dr. Parkinson, Dr. Pickels, Dr. Pollard, Dr. T. H. Rankin, Dr. Ross, Dr. E. L. Sieger, Dr. W. H. Sieger, Dr. J. S. Smith, Dr. Smythe, Dr. Snell, Dr. Stewart, Dr. Thomson, Dr. Twomey, Dr. Watson and Dr. A. H. Wilson.

The material was received from Abakaliki, Afikpo, Aro, Bamenda, Benin City, Bonny, Brass, Buea, Calabar, Enugu, Forcados, Freetown, Ibadan, Ikom, Ikot-Ekpene, Kaduna, Lokoja, Maidugari, Minna, Naraguta, Ogoja, Okigwi, Onitsha, Owerri, Port Harcourt, Sapele, Sokoto, Victoria, Wannune, Warri, Zungeru.

A. CONNAL,

Director of the Medical Research Institute.

1st July, 1918.

[illegible]

Receptacle.	Larvae.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Cul neb.	Steg fasc.	Anoph cost.	Cul dec.	Steg Int.	C. thal.	C. soml.	A. funest.	Ochl irr.	Ochl nig.	Uran ann.	C. fat.	C. dutt.
Tank	Steg fasc ...	3	1	1	...	1	...	3	2	...	2	...	1	9	...	14	...	1	...	...	...	...	...	...	...	...
Tin	Steg fasc ...	3	1	1	...	...	1	...	2	...	2	...	...	6	...	14	...	...	...	...	...	...	...	...	...	...
Top of Tank	Cul neb ...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Tub	" " Steg fasc ...	1	1	...	...	...	...	1	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Swamp	Cul decens ...	...	1	1	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
	Uran annulata ...	1	1	1	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
	" " C. dec	...	1	1	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
	Cul decens ...	...	1	1	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
	" " Steg fasc	...	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Uran ann, Ochl nig	...	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Steg fasc ...	5	...	1	...	3	4	2	...	...	2	...	1	29	...	29	...	...	...	...	...	...	...	...	...	...
	Cul decens ...	1	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...
	Anoph cost ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	C. dec (Cyclops)	1	1	1	...	...	...	...	...	...	...	...	...	...	2	...	3	...	...	...	...	...	...	...	...	...
Well	" " (Daphnia)	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	" Steg fasc ...	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Steg fasc (Cyclops)	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	" " (Psychodids)	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	" " Anoph cost	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Cul neb ...	...	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	C. fat ...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Ochl irritans	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	C. dutt. Anoph cost	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Total collections		143	99	55	56	67	77	72	47	25	114	114	44	913	291	494	82	33	8	5	1	1	21	8	16	1

INDEX TO MEDICAL RESEARCH INSTITUTE REPORT.

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ANNUAL REPORT OF THE GOVERNMENT DENTIST FOR 1917.

The following is the report of the dental work done in Nigeria during 1917; from September 20th to December 31st inclusive.

2. Number of officials, wives and children, etc., attended:—

European Officials	...	...	182
Native Officials	...	...	117
Others	...	...	5
Total	...	...	<u>304</u>

3. The following conditions were treated:—

Caries simplex	...	...	...	...	201
Pulpitis	...	...	...	...	73
Dento-Alveolar Abscess	...	...	...	...	12
Neuralgia	...	...	...	...	2
Periostitis	...	...	...	...	31
Pyorrhœa Alveolaris	...	...	...	...	10
Exostosis	...	...	...	...	2
Erosion	...	...	...	...	7
Pulpal polypus	...	...	...	...	2
Mucosal polypus	...	...	...	...	1
Gingivitis Acuta...	5
Gangrene of Pulp	2
Total	<u>348</u>

4. Treatments:—

Extractions	73
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Conservative:—

Synthetic porcelain	21
Amalgam (Silver)	59
Amalgam (Copper)	5
P. G. P. (Permanent Gutta Percha)	...	...	...	14
T. G. P. (Temporary Gutta Percha)	...	...	...	19
Root fillings and dressings	...	...	...	91
Scaling, polishing, etc.	...	...	...	20
Total	...	...	...	<u>302</u>

5. I arrived in Lagos on September 20th, 1917, and remained there until the close of the year no other station being visited. Owing to the war I was without a trained mechanic and prosthetic work was not attempted. Even the surgical and conservative work is more than one man can adequately cope with and a whole tour could, with advantage, be spent in Lagos alone. A permanent and properly equipped surgery in the Hospital would greatly facilitate the work and as Lagos now possesses both a pipe-borne water supply and electricity it is to be hoped that the equipment of such an office will not be long delayed.

I have, etc.,

H. F. HARDIE.

May 23rd, 1918.

Notes on "Calabar Swelling" by Dr. W. F. Macfarlane.

Most of the natives here and all the Europeans who have resided in the district for any length of time have *Filaria Loa*. It appears to affect the Europeans and natives in a different way.

In the European the worm is rarely actually seen under the Conjunctiva; the symptoms complained of mostly being puffy swellings on the back of the wrists, and stiffness of the fingers, in some cases bad enough to make writing very difficult, if not impossible; also a marked redness of the palms of the hands, noticed in some Europeans who have been many years resident, is probably attributable to the same cause. (*Filaria Loa*).

Their general health apparently is not affected, and the puffy swellings are only transient.

In natives one is generally first advised of the presence of *Filaria* by a patient coming to the Dispensary with the *Loa* apparent under the Conjunctiva.

They are not usually troubled with any swellings, nor is their general health altered.

Chrysops abound in the neighbourhood of Sapele. The large Rubber Plantation of Messrs. Miller Brothers, north of the Benin river, harbours them in large numbers, but they are not more prevalent there than elsewhere in the neighbourhood.

The Rest House at Ologbo was particularly infested, I found, when I was there last (Ologbo is between Benin City and Sapele); as one gets into higher, and drier land, on approaching Benin City, they practically disappear.

The notoriety of the Rubber Estate probably arises from the fact that the ravages of the flies are brought into evidence by the complaints of hundreds of half naked labourers employed there daily, whereas nothing is heard from farmers in the bush, who are not in touch with the European.

There is no doubt however that the chrysops is very abundant on the Miller Brothers Plantation, and through the courtesy of Mr. Methven, the Manager of the Estate, some hundreds were sent down monthly for many months to the Director of the Research Institute at Yaba.

The *modus operandi* was to supply the rubber tapper with a light cane bat, with which they killed the flies with a gentle tap, when they found them settled on their own, or neighbour's body.

After much diligent search I have failed to find the eggs or larvæ described by Austin (African blood sucking flies), but have now had a large cage built into which I shall introduce the live flies with their suitable surroundings, foliage, water, etc., and hope to get some definite idea of their life history.

Notes on cases by Dr. E. E. Maples.

Pulmonary Tuberculosis.—During the three years 1915 to 1917 the treatment of Pulmonary Tuberculosis among natives by Tuberculin injections was carried out. Twenty cases of Phthisis were admitted to Hospital and in all instances the Tubercle Bacillus was identified in the sputum by the Ziel-Neelsen method before the diagnosis of Tuberculosis of the Lung was accepted. The preparation used in treatment was Burroughs Wellcome & Co.'s Tabloids (Hypodermic) New Tuberculin (W) Human, and injections were given subcutaneously and repeated usually at an interval of 5 days. The initial dose was usually 0.0001 mgm, increasing each subsequent injection by 0.0001 mgm or even by 0.0002

mgm, provided the patient had recovered from the re-action and that no ill effects were observed. There was no doubt about the potency of this particular tabloid preparation of Tuberculin for the cases shewed reaction to the injections. The injection was not given to patients when the disease was very active and temperature running high, but in cases with moderate signs and fever it was administered.

The results varied; in twelve cases,—rather more than half,—at first there seemed to be considerable improvement; the patients put on flesh and the temperature came down to normal in the course of time, yet there remained the difficulty to decide how far these improvements were due to the Tuberculin, and how much to the rest in bed, fresh air, and dieting. In one case with pleuritic effusion there seems to have been a permanent cure; in others, although discharged from hospital with the disease, as evidenced by physical signs in the lungs, in an apparently fairly quiescent state and with temperature normal, with the abandonment of treatment outside Hospital, the disease quickly returned and death in several cases was known to have ensued.

In the remaining eight cases death occurred in Hospital. In five of them treatment with Tuberculin had been carried out, whilst in three no Tuberculin was given.

In two of these Tuberculin-treated cases, the results clearly seemed to be definitely bad, for although their temperatures were normal, and the signs and symptoms had moderated, death ensued in both patients from a sudden violent haemorrhage (flour sanguinis).

No conclusions therefore can be drawn from these cases as to the utility of Tuberculin injections in the treatment of Tuberculosis of the Lungs.

I attach the temperature charts of fourteen of the patients treated.

Treatment of Malarial Fever by Intravenous Injections of Quinine.

Following the methods of several observers as reported in the Tropical Diseases Bulletins of the 15th June, and 15th September, 1917, a trial was given of this mode of treatment. The preparation used was a plain sterilised solution of Quinine-bi-hydrochloride in water without Urethane or Artificial Serum, and of a strength of 1 gr. to 1 c.c. The usual dose given was 10 c.c. (10 grs.) daily, injected into the veins at the bend of the elbow in a similar method to that in which Galyl is given. The results were remarkable, the temperature in all instances falling to normal within 48 hours. One injection daily for three days was given and proved sufficient, no patient shewing a relapse of fever. No ill effects were noticed, except faintness in one debilitated patient, whilst all of them experienced immediately and while the injection was still taking place, a feeling of warmth throughout the body and especially a sensation of heat in the throat, with in some instances, a certain amount of dizziness.

Poisoning from Cassava.—A case was brought to Hospital in which a child was poisoned by eating cassava, another child (aged eighteen months) of the same parents having died during the early hours of the morning on which our patient was admitted. The patient, a female child of three years of age, was suddenly seized at midnight with severe pains in the abdomen accompanied by violent vomiting, and quickly became unconscious. She was brought into Hospital about 8.30 the following morning in a semicomatose state; the pulse was then 128 per minute and very feeble, with respirations 46 a minute, and temperature 101°F; the skin was cold and clammy. Restoratives were administered, consisting of saline with brandy subcutaneously, and of strychnine and pituitrin also hypodermically. About 10 a.m., she became fully conscious and then complained of pain and tenderness over the region of the stomach, and she vomited continually a greenish

yellow fluid. An emetic of mustard and water was given at 11 a.m., and the saline and pituitrin were repeated at noon. The child was much better at 4 p.m. the same day, and had recovered by the following morning.

This is the first case of cassava poisoning I have encountered so far.

It appears not to be unknown among the Efiks, but I have been unable to ascertain the particular species of cassava or the method of its preparation which gives such unfortunate results.

Calabar Bean Poisoning.—Poisoning from this bean is occasionally met with in Calabar, being sometimes self-administered as a sort of "ordeal" to demonstrate that the victim is not guilty of an allegation of being a witch. It is also a method of suicide among the Efiks.

During the past 3 years I have seen some half-a-dozen cases. The most striking symptom is the remarkable slowing of the pulse, and just before death its rate may fall as low as 20 or even 10 to the minute.

In addition to the bradycardia, the respirations become slow and sighing (but not by any means in proportion to the slowing of the heart's beat), the patient becomes comatose and finally dies of cessation of the beat of the heart. There is frequently a frothy mucus about the lips and nostrils, but the pupil is seldom contracted, as one might expect that it would be in view of our knowledge, of local action of Eserine on the pupil. It is occasionally dilated, but is usually in a position half way between complete contraction and complete dilation. The post mortem signs are very equivocal; portions of the bean may be found in the stomach and even as far down as the ileum, but a difficulty arises in identifying them as portions of the Esere bean, or even of a leguminous bean. In all cases so far, the heart has been small and contracted in systole and there has been a pronounced fluidity of the blood, no post mortem clots whatsoever being found in the heart or vessels. Apart from this the only condition noticeable has been a congestion not only of the vessels of the cortex, but throughout the brain substance.

The following method which I carried out in one instance may be of some help in doubtful cases. The pieces of bean were picked out from the contents of the stomach and intestines and pounded up in a mortar. As Physostigmine is soluble in alcohol, the alkaloid was extracted with Rectified Spirit. 5 c.c. of the extract was then taken and injected into the subcutaneous tissues of a cat whereupon the animal became comatose in a few minutes and died within quarter of an hour with the same cardiac and respiratory failure as occurs in the human being in cases of Esere Bean poisoning. The pupil was not contracted in this cat.

Impotence.—A very common condition which leads middle-aged male natives to consult a Medical Officer is on account of impotence. I used to look upon excessive sexual intercourse in earlier life as the essential factor in the production of this condition and no doubt, with the present system of polygamy prevalent in Southern Nigeria, this is an important factor, but it is often not the sole one. It will be found that in large proportion of these cases, there is present a condition of early Chronic Bright's Disease, and it is to this that treatment should be directed and not to the impotence.

*Papillary growth of skin treated by intravenous injection of
Tartar Emetic.*

I wish to record a case in which a woman who had an apparent tendency to tumour, in so far that she had very numerous papillomata covering a large area of skin in and about both axillae, a few papillomata between the breasts and diffuse lipomata of the back and side of

chest, was benefitted, as regards her papillomata, by the intravenous injection of Tartar Emetic. When she was originally admitted to Hospital, she had large portions both of the papillomatous skin of the axilla and of the diffuse lipomata removed, but it was found impossible to excise all the warty skin of the armpits. She returned a few months later after her first discharge from Hospital, with fresh growths of moist papillomata in her axillae, and I then gave her 10 c.c. of a 1% solution of Tartar Emetic intravenously. The result was striking, for within a few days the warts became dry and had shrunk very considerably. The patient only received two injections intravenously,—one of 10 c.c. and another a week later of 20 c.c.,—because of the scarcity and small size of her veins, it being found impossible to give the injection without dissecting out a vein. As a consequence, the Tartar Emetic was continued per rectum, 30 c.c. of a 1% solution being given once a week. In all she received twelve injections, and with these and local application of Caustic Potash all the papillomata have disappeared and, more important, have not occurred.

Retinal Cases.—In most natives the iris is black and the retina when viewed by the Ophthalmoscope shews a striking difference in appearance to that of any European. In the latter the fundus in health is bright, red, and clear, without dark pigmentation; in the former, there is a general diffuse pigmentation which causes the retina to appear as a dark background. When a retinitis supervenes, in certain cases the difference becomes still more striking, for then this black pigment, in a native, may get massed together, around, at the side, and between the white patches of retinal degeneration. This appearance is most striking—the pigment masses presenting a completely different appearance to the scattered stellate pigment seen in Retinitis Pigmentosa in an European. It is to be noted moreover, that there are differences between the ophthalmoscopic retinal appearances of brown, hazel or grey-eyed Europeans and equally brown, hazel or grey-eyed negroes of whom a few are met with from time to time, especially in the Cross River districts. In the native there is a diffuse deposit of pigment in the retina in all three classes of the lighter coloured eyes (irises), causing the fundus, even in these cases, to appear as a dark back-ground. The only difference between the classes is that usually the lighter the iris, the less dark the pigmentation of the retina. In Europeans, however, whatever the colour of the iris may be, although the retina may not appear equally bright red in all, there is no distinct deposit of pigment which can be recognised. I must add, however, that in the one case in which the retina of a bright grey-eyed native was examined, the deposit of pigment was not evenly distributed over the retina; there was a patch on the nasal side where the fundus was quite brightly red, and even elsewhere there was a tendency to patchiness in the pigmentation. This case was remarkable on account of the right eye having the iris a bright clear grey, while the left iris was quite black.

When one considers the embryology of the retina how it originates in an outgrowth from the central nervous system which is itself formed by an involution of Epiblast, the pigmentation of it in all negroes is not to be wondered at. Having the same embryological origin as the skin, it is natural that the pigmentation of the retina should go hand in hand with this structure, and we can infer therefore that the pigmentation of the retina in a negro will be in proportion to the pigmentation of the skin, the darker the skin the darker the retina, and *vice versa*. Clinical experience confirms this. If two natives with equally brown (or equally hazel) coloured irises are examined, it will be found that the one with the brighter coloured skin has the retina less darkly pigmented. The reason why at first sight the degree of retinal pigmentation appears connected with the colour of the iris, is because it usually happens that negroes with light coloured irises have correspondingly light coloured skins.

There appears to be in natives an obscure condition causing failure of vision, and for which I cannot account. In 1917, I came across at least six cases of failure of sight with no local signs or general cause to account for it. In the two female cases, the amblyopia came gradually but fairly rapidly after childbirth; in the other and male cases, no cause could be assigned. Nothing was discovered amiss by myself,—or I may say by other practitioners;—either with the refraction or with the eye generally, sufficient to account for the symptoms. In watching one case a condition of optic atrophy finally supervened, and could be recognised by the ophthalmoscope. Possibly some of them arose as a tobacco amblyopia, for in one case a distinct whitening of the temporal, in contradistinction with the nasal side of the disc would be seen. In other cases, however, the patient neither chewed, smoked, nor snuffed tobacco in any form, nor could the amblyopia be assigned to any condition of eye itself or of the nervous system, or of the general body health.

The lack of a perimeter is a great drawback in the diagnosis of these cases, for it is possible that with its aid their nature could have been elucidated.

Position of Appendix in Natives.—The investigation, started in 1915, into the position of the appendix in natives by observation on dead bodies brought in for post mortem dissection, was continued during the years 1916 and 1917. Following the classification of 1915, according to the hour position, the results for the three years 1915 to 1917, were as follows:—

(a)	In $\frac{1}{4}$ past hour position	...	...	...	23·4%
(b)	„ half hour	„	...	...	16·3%
(c)	„ $\frac{1}{4}$ to „	„	...	...	9·7%
(d)	„ 5 mins. past hour position	...	...	...	9·0%
(e)	„ hour	„	...	...	7·9%
(f)	„ 25 mins. past hour	„	...	...	6·9%
(g)	„ 10 „ „ „	„	...	...	6·2%
(h)	Coiled up directly behind Cæcum	...	...	...	5·7%
(i)	In 25 mins. to hour position	...	...	...	5·4%
(j)	„ 20 „ past hour	...	...	...	4·7%
(k)	„ 10 „ to hour position	...	...	...	2·8%
(l)	„ 20 „ „ „	„	...	...	1·9%

In 39·5% of cases investigated, the appendix had one or more coilings upon itself as it lay in its position and among these 39·5% with coilings, there existed in 13% an acute (hair-pin) bend on itself also. In 17·8% of cases investigated, the appendix was surrounded or enclosed in adhesions or membranes, but in only 1·8% out of this 17·8% was there any sign of old inflammation in the appendicular wall itself.

There seems to be little value in the presence of membrane or adhesions as a sign of old appendicitis, and the extreme rarity with which appendicitis is met with clinically in natives confirms this opinion.

The figures are obtained from observations on 91 corpses dissected during 1915 to 1917.

Hæmoglobinuric Fever.—With extended experience, one realises that Hæmoglobinuric Fever although rare, is not so infrequent among natives as is supposed. In 1916 there were two cases encountered among natives, one of whom died and one of whom recovered.

In 1917 only two cases altogether were encountered, one in a native who recovered and one in a Syrian who died.

Hitherto my personal opinion has been that an attack of Black-water Fever is always preceded by the patient taking a rather larger dose of quinine than usual,—in other words that quinine is always the ultimate exciting factor in the production of Hæmoglobinuric Fever,—but I may now have to modify this opinion. In the case of the native treated this year, there is a distinct history of a large dose of quinine having been given before the onset of the attack, but in the case of the Syrian no such case history was found. This patient took his prophylactic dose of 5 grains of quinine regularly every day, and had not had an extra dose of quinine before the attack. This case of Hæmoglobinuric Fever was remarkable in several ways. To start with, the patient lived through five successive attacks of hæmoglobinuria, and during the intervals the urine practically cleared up each time. The first attack occurred on the 20th October; on the 25th, the urine although normal in the morning time, was claret coloured at 7 p.m. and later on that evening another attack—a mild one—of hæmoglobinuria occurred. On the morning of the 27th there was no hæmoglobin in urine, only a very faint trace of albumin being present, yet at noon he had another very mild attack of hæmoglobinuria; at 6 p.m. the same night the urine was free from blood pigment again, and contained but a very faint trace of albumin yet at 3 a.m. the next morning, that is on the 28th, a still further mild attack ensued. The urine cleared up on the same day, and remained quite normal (even without a trace of albumin) till 2 p.m. on the 30th, when he had a fifth and this time a more severe attack of hæmoglobinuria. On the morning of the 1st November the urine was again free from blood pigment, although albumin was still present, but by the 4th November the urine was absolutely normal again and remained so till his death on the 13th November. In the beginning all quinine was stopped, but after the fifth attack of hæmoglobinuria the patient's temperature commenced to rise steadily and continued to do so. Seeing that his condition was getting desperate, and that he had had five attacks when quinine was withheld, after consultation, I decided to administer quinine. Starting on the first day, that is on October 31st, with half a grain of Euquinine by mouth given twice daily, morning and night, it was increased on the second day to six grains of quinine bihydrochloride given intramuscularly, which was again increased to twelve grains intramuscularly on the next and successive days. No further attacks of hæmoglobinuria occurred, but the temperature continued to rise steadily till the patient's death.

On the 8th November, as the patient's condition was getting steadily worse and the liver more congested, Emetin was administered tentatively, $\frac{1}{2}$ grain being given subcutaneously and continued daily. This had no effect upon the course of the disease, the temperature continuing to rise. On the 11th November, following the experience of an observer in the British Medical Journal in 1916, I gave the patient an intravenous injection of Neo-salvarsan. Although this had no good effect on his condition, it certainly had not a bad one. The patient died rather unexpectedly on the afternoon of the 13th November, becoming suddenly delirious, the respirations failing while the heart continued beating strongly until almost the last few minutes.

Another remarkable feature was the large quantity of urine passed throughout the illness. The essential element in treatment consisted in the administration per rectum of glucose saline four hourly, one oz. of glucose being dissolved in each pint of saline. During the whole course of the illness, the least quantity of urine passed by the patient amounted to 26 ounces, while the maximum was 105 ounces, the average being well over 60 ounces daily.—At the same time as I have noted before, the urine cleared up very quickly and almost entirely between the attacks. Another feature was the remarkable strength of the heart which continued beating strongly and regularly after the respirations commenced to fail. I therefore conclude that the admini-

stration of dextrose with the saline was an important factor in obtaining these results, for both its diuretic and its stimulating action on the heart, are well known.

No malarial parasites were found at any time in the blood, and it is interesting therefore that five attacks of hæmoglobinuria should occur when quinine was being withheld, and that after the administration of quinine none should recur. The continued and progressive rise of temperature after the fifth attack, and therefore almost coincident with the administration of quinine, is noteworthy, as also the absence of effect upon it of the injection of Emetin and Neo-salvarsan. To sum up, this case of Hæmoglobinuric fever presents unusual features in:—

- (a) The recurrence of five attacks of hæmoglobinuria,
- (b) The large quantity of urine passed throughout the illness.
- (c) The rapidity with which the urine became normal (or nearly so) during the intervals between the attacks,
- (d) The progressive and continued rise of temperature after the fifth attack, which continued in spite of the intramuscular injection of quinine, administered within 48 hours of the rise,
- (e) The recurrence of attacks of hæmoglobinuria during the withdrawal of quinine, and subsequently, their absence during its administration,
- (f) The remarkable strength of heart throughout the illness which condition continued until almost the last moments, and long after the respiration had begun to fail.

I attach a copy of the temperature chart.

Cases of Enlarged Liver and Spleen in Natives.—The differential diagnosis between the various conditions giving rise to enlarged liver combined with enlarged spleen in natives, is often extremely difficult, and during the course of practice in West Africa one meets with a few examples each tour. The cases almost invariably have a sufficient degree of anæmia of the chlorotic type to be noticeable, accompanied with chronic low fever. They may or may not have ascites; if it is present it may be small in quantity or large, in the latter case as much as 3 gallons perhaps being removed at one tapping. One factor in the difficulty arises from the impossibility of forming a correct opinion as to whether the enlarged spleen originates as an essential part of the same disease as that which caused the enlargement of the liver, or as a chronic malarial enlargement (either solely or in part). Another difficulty is that owing to lack of facilities for obtaining a Wassermann test, a decision as to whether there can be a syphilitic element or not in the disease, cannot be arrived at.

Putting aside the cases of enlarged liver (accompanied by chronic malarial enlargement of the spleen) from backward engorgement in valvular disease of the heart, and the Leucæmias, all of which should be diagnosed with comparative ease, the following list covers the usual possibilities in West Africa:—

- (a) *In children.*—Congenital Syphilitic Cirrhosis of the liver, with accompanying enlargement of the spleen.
- (b) *In adults.*—Cirrhosis (so called alcoholic) of the liver, with accompanying enlargement of the spleen.
- (c) *In both children and adults.*—Gunma of the liver, with chronic malarial enlargement of the spleen (but only usually in adults).
- (d) Splenic Anæmia (called in its later stages Banti's disease).
- (e) A condition in which there is an enlargement of the liver—usually fatty in nature—accompanied by a perihepatitis as evidenced by the formation of adventitious membrane, so that the enlarged liver may

be almost enclosed in thick perihepatic membrane. Along with this, the spleen is usually affected in the same way and covered with an adventitious perisplenic membrane. There is also frequently a thickened peritoneum (from chronic peritonitis) and usually (especially in the later stages), ascites.

Such cases may be associated with chronic inflammation elsewhere leading to other adventitious membrane formation, such as chronic mediastinitis, pericarditis, or pleurisy, and even with chronic interstitial nephritis, perhaps forming part of a general condition known in England as Chronic Polyserositis. Such cases are occasionally met with in the post mortem room, and in one instance I have encountered them in life.

(f) Leishmaniasis—either *Donovani* or *Infantum*.

As most of these patients are infected with ankylostomes, a further difficulty arises in estimating to what extent the anæmia and fever are due to this helminthic infection. One of the first steps therefore in the elucidation of the diagnosis in a doubtful case should be to get rid of the Ankylostome factor by treatment with thymol.

In Cirrhosis of the liver, both in children and adults, whether syphilitic or non-syphilitic in origin, often one of the earliest and most noticeable signs is enlargement of the spleen which may be so large as to engage the attention of the practitioner more than the liver condition which accompanies, indeed causes, it.

As regards the cirrhotic cases in adults, an aid in the diagnosis will possibly be found in other alcoholic signs which may be present, *e.g.*, Peripheral Neuritis, while Gumma of the liver and chronic Malarial enlargement of the spleen will usually quickly respond to treatment by Potassium Iodide and Quinine. As regards Leishmaniasis, although I have punctured many livers in this country in the search for a *Leishmania* parasite, I have found none so far, yet it must not be lost sight of that there is a possibility that Leishmaniasis does exist in West Africa. If the above cases can be eliminated, there may remain much difficulty in diagnosing between (a) (d) and (e).

In the latter stages of Splenic Anæmia, there is a Cirrhosis of the liver often accompanied with ascites; the disease is then known as Banti's disease. In the later stages of Congenital Syphilitic Cirrhosis, there is also ascites. In the later stages of Chronic Perihepatitis, there is also ascites. In all three there is an anæmia of the chlorotic type.

It may be impossible to eliminate the congenital syphilitic cases owing to lack of a Wasserman reaction, or from an absence of other congenital syphilitic signs, or because the cirrhosis is so far advanced as regards fibrous tissue formation, that no response is shewn to treatment with Mercury and Potassium Iodide. The question then arises what further steps can be taken to clear the diagnosis up with a view to treatment. I now consider that, if the condition of the patient permits, it is justifiable to perform an exploratory laparotomy, especially as a Splenectomy will undoubtedly cure the condition known as Splenic Anaemia or Banti's Disease.

At such a laparotomy the perihepatic condition can be easily recognised and so can a Cirrhosis of the liver, but it may be impossible to differentiate between the Cirrhosis in Banti's Disease and that in Congenital Syphilis. If the perihepatic condition is found, it is possible than an Omentopexy will benefit the condition, and therefore it should be tried. But if the cirrhotic condition is found, what is to be done then? I consider that it may be justifiable to remove the spleen in these cases.

Splenectomy, if successfully performed, is harmless; if the case is one of Banti's disease the patient will certainly be cured, while if the case is one of Congenital Syphilitic Cirrhosis no harm will be done, on the contrary good may ensue, for in cases of syphilitic anaemia in children, and in certain cases of Cirrhosis of the liver, Mayo reports that good results have ensued from Splenectomy.

I have undertaken exploratory laparatomies in two doubtful cases in 1917; in one the perihepatic condition was found while in the other Cirrhosis of the liver was recognised. In both cases, nothing further was done beyond the exploratory laparotomy, but in similar cases in the future I should probably perform an Omentopexy and a Splenectomy respectively. There is one consideration which urges us to such active treatment and that is that unless something radical is done, the patients will certainly die from their disease in a short period.

In this connection I attach a copy of the temperature chart of the case (a boy named Joseph) who was found upon laparotomy, to have a cirrhotic liver. This patient, in addition to his very large liver and spleen, suffered from ascites, as much as 10 pints being removed at one tapping. The boy died about 3 months after his discharge from hospital.

It would be interesting to have a record the Wassermann reaction in these doubtful cases with a view to ascertaining how far Syphilis is a factor, if any, in either Banti's Disease or the chronic perihepatic condition. I know of no such observations having been taken so far.

It is to be remarked that in any case of enlarged spleen in which a Splenectomy is performed, where the enlargement of the spleen turns out to have arisen partially from chronic malaria, not only is no harm done, but benefit is conferred, as Splenectomy is justifiable in cases of chronic malarial enlargement of spleen.

My object in writing this report is to call attention to these cases, and if possible stimulate observations as to the value of surgical procedure in their treatment.

Notes on three cases by Dr. F. Ross.

Case of Multiple Abscesses.

Oye—Agbo, a Prisoner, a Sobo man, Age about 35.

6/5/17.—Complaining of Rheumatic like pains in Left Side of Chest and Right Buttock. Put on Mist. Sod. Sal. Alkaline. No Physical signs.

18/5/17.—Swelling in Left Scapular Region which was fomented with Lead and Opium. Temperature 99.4

20/5/17.—Swelling incised and 1½ ounces of thick greenish yellow pus evacuated. Cavity drained.

24/5/17.—Some swelling of Right Buttock. Very little discharge from chest wound which is closing.

26/5/17.—Chest wound closed. Hip still the same. Some constipation from time to time. Temperature always about 99.

2/6/17.—Hip remains slightly swollen, neither larger nor smaller. Temperature 99. Nothing else to note. Weight 120 lb.

3/6/17.—Slight swelling discovered over *Left* Great Trechanter.

6/6/17.—Deep fluctuation now felt over Right Hip. Skin frozen with Ethyl Chloride and incision made. Pus found about an inch from surface and at least an ounce evacuated. A film made of the Pus and sent to Yaba.

13/6/17.—Abscess has healed very nicely. Swelling of Left Thigh diminished.

23/6/17.—Discharged from Prison quite well.

30/6/17.—Report from Yaba:—"No fungi found but there are numerous little groups of Staphylococci some of them intra-cellular."

Note:—A similar case was reported by my predecessor in last Annual Report. The Prognosis in these cases appears to be favourable in young robust subjects, especially when good "health" pus is found in the abscess.

Case of Ankylostomiasis.

Umukoro, a Prisoner, Native of Kekerri near Sapele. Age 25. Admitted to Prison on 20th May, 1917. Sentence 6 months.

1/6/17.—Reported sick with Diarrhoea. Small in stature, poor Physique. Marked Anaemia but heart sound.

2/6/17.—Faeces examined. In one Low Power Field 50 Ankylostome Ova were counted. Weighs 84 lb. On admission to the Prison his weight is recorded at 92 lb. Observed during the day and Bowels not moved.

3/6/17.—Bowels moved twice in the last 24 hours. Slight Diarrhoea.

7/6/17.—B Naphthol gr x at 6, 8 and 10 a.m. Mist Alba 4 p.m. Ankylostomes recovered from stools.

9/6/17.—Weight 85 lb. Patient says he feels "better small."

15/6/17.—B Naphthol as above.

25/6/17.—Weight $87\frac{3}{4}$ lb. Given Mist Ferri et Amon Cit.

26/6/17.—Faeces examined. No Ova found but sample was taken from a rather solid stool.

28/6/17.—D Naphthol repeated.

29/6/17.—Weight $86\frac{1}{2}$ lb.

3/7/17.—Weight 87 lb. Iron Mixture increased. Patient is much better and takes his food well.

18/7/17.—Weight 87 lb. Improvement in general health continued. Conjunctiva shows streaks of red now.

2/8/17.—Weight $89\frac{1}{4}$ lb. No Ova found in Faeces.

8/10/17.—Weight 91 lb. Conjunctiva a good deal redder. The Patient feels much stronger, complains of nothing and is able for work.

19/11/17.—Discharged from Prison to all appearances well.

Case of Bilharziasis.

Moma, a Prisoner, Hausa, Age 25.

Born in Marua Kamerun, went to Yola when about 9 years of age. Has lived in Lokoja, Ibi, and for a short time in Warri.

28/6/17.—History 6 months ago had Gonorrhoea and apparently Cystitis. The frequency of micturition is very marked, about a teaspoonful of urine and blood passed at a time. A little of this was put in a test tube which was swung round on the end of a string and a drop from the

deposit examined. Terminal spine ova and a few Miricidia found—the urine had stood some time before being examined. Specimen in Corrosive Alcohol sent to Yaba and Ova found in it.

18/7/17.—The patient's symptoms appear to have been somewhat alleviated by an alkaline mixture plus Hyoscyamus. Complains of pain chiefly when in bed. Frequency not quite so urgent. General health not impaired.

18/8/17.—Seems improved in general health. Still passes blood stained urine frequently but symptoms not so marked. Patient discharged from Prison and has left the District.

Case of Helminthiasis.

Akwohan, a Prisoner from Ehoru, Benin District. Weight 115½ lb.

14/3/17.—Admitted to Prison Hospital complaining of Abdominal pains, Diarrhoea alternating with constipation. Some Anaemia and Oedema of Foot. Examination of Faeces revealed Ova of Ankylostomes, Ascaris and Trichocophalus; and a highly amoebic Oiliata—Balantidium (Coli?). Slide sent to Yaba along with a specimen of Faeces in Sublimate Alcohol.

B Naphthol given, gr. x at 6, 8 and 10 a.m. followed by Mist Alba at 2 p.m. on two occasions, with an interval of a week between. A very troublesome patient who would not keep in bed and got out of Hospital whenever he could, with the result that the Oedema of Feet increased.

3/4/17.—Weight 112 lb. Diarrhoea from time to time.

11/4/17.—Weight 88 lb. Patient getting very weak, unable to get up now.

12/4/17.—Had Emetine gr. ½. Very severe Diarrhoea.

13/4/17.—Weight 79 lb. Heart action very feeble.

15/4/17.—Patient Died.

5/5/17.—Report received from Yaba confirming Balantidium.

Report upon two cases of Liver Abscess by Dr. W. R. Parkinson.

Case 1. Davies; male, aged 27 years; a labourer; native of Asaba. Admitted to hospital April 2nd, 1917, with a history of pain over the liver and the right shoulder, fever and drenching night sweats; no definite history of dysentery could be obtained.

Liver dulness extended from the 4th rib in the parasternal line to the level of the umbilicus; there was tenderness over this area. The tongue was slightly furred. The urine contained albumen ½% and a trace of bile.

On 4th April the patient was given one third of a grain of emetin subcutaneously and this treatment was continued three times a day for sixteen days.

On the 6th of April the needle of Potain's aspirator was pushed into the liver between the 8th and 9th ribs in the anterior axillary line and 45 oz. of typical pus were removed. The needle was withdrawn when there was some admixture of blood with the pus. The operation was done under a local anaesthetic of hemisine and cocaine.

On the 8th 42 ozs. more of pus were removed completely emptying the abscess cavity. No injection of quinine or emetin was made into the cavity.

The effect on the temperature is shown in the attached chart. The patient was discharged on the 22nd of April cured without any further aspirations. The liver dulness was back to normal limits.

Case II. Adu Plejofi; male, aged 30 years; a police constable, native. Admitted to hospital on the 8th of September, 1917, with a history of a swelling of the abdomen for 1 month; a little pain; night sweats; and feeling of illness. No knowledge of previous dysentery.

He looked very ill, tongue was furred, he had deep sunken eyes and a thin feeble pulse of 56 only. His temperature was 98.6 on admission and was not above 99 at any time during the disease.

There was a large fluctuating swelling in the epigastrium and out to the right flank all within the area of liver dulness, which began above at the 5th cartilage at the edge of the sternum and extended 3 inches below the costal margin where a firm edge was easily felt. With Potain's aspirator, the needle passing between the 7th and 8th ribs, in the anterior axillary line, 101 oz. of reddish brown pus were removed. The last 6 or 7 oz. were very thick and required a high vacuum and considerable patience to exhaust.

Emetin was begun on the day of aspiration, the 9th September, and continued for 20 days; the dose was one third of a grain twice a day. On the 11th September the temperature was normal and remained so. The patient complained of a little pain in the right subcostal region and of giddiness.

He was getting up on the 13th, and was discharged cured on the 29th without further aspirations and with his liver within normal limits.

NIGERIA
NORTHERN PROVINCES.

ANNUAL
MEDICAL AND SANITARY
REPORT

FOR THE
YEAR ENDING 31ST DECEMBER, 1917.

Annual Medical and Sanitary Report, for the year ending 31st December, 1917.

NORTHERN PROVINCES, NIGERIA.

I. ADMINISTRATIVE.

The Medical Staff consisted of :—

- 1 Principal Medical Officer.
- 1 Deputy Principal Medical Officer.
- 2 Provincial Medical Officers.
- 4 Senior Medical Officers.
- 35 Medical Officers.

PROMOTION :—

Dr. H. R. Ellis was transferred on promotion from the Southern Provinces to be Senior Medical Officer on 16.6.17.

TRANSFERS :—

- Dr. A. E. Horn was transferred to Sierra Leone on 16.6.17.
- „ J. Currie was temporarily transferred to Uganda on 2.4.17.
- „ R. F. Williams was transferred to the Gold Coast on 29.4.17.

APPOINTMENTS :—Nil.

RETIREMENT :—

Dr. C. T. Costello retired on pension on 22.10.17.

DEATHS :—

- Dr. L. Doudney, died at Komba near Nafada.
- „ A. J. T. Swann, died at sea, on the occasion of the sinking of the s.s. “ Apapa.”
- Drs. H. L. Burgess and J. E. L. Johnston, lost at sea with the s.s. “ Umgeni.”

The following Medical Officers served with the army in Europe and East Africa, viz. :—

Dr. E. A. Chartres	Dr. H. North
Capt. F. E. Bissell	„ P. W. Black
Dr. J. Lindsay	„ W. A. Trumper
„ A. J. M. Crichton	„ E. J. Powell
„ L. W. Davies	Capt. J. M. Benson
„ B. J. Courtney	Dr. C. J. H. Pearson
„ W. J. Cobb	„ W. J. Martyn-Clark.

Nursing Staff consisted of :—

- 1 Male Nurse.
- 2 Senior Nursing Sisters.
- 12 Nursing Sisters.

APPOINTMENTS :—Nil.

TRANSFERS :—

Sister E. F. Dunne, Senior Nurse, was transferred from the Gold Coast.

Sister I. J. Evans was transferred on promotion to the Gold Coast on 10.8.17.

RETIREMENT:—

Sister M. A. Ward, Senior Nurse, retired on pension on 15.6.17.

RESIGNATIONS:—

Sister E. A. Taylor, Senior Nurse, resigned on 30.11.17.

„ A. L. Walker, Nurse, resigned on 31.5.17.

„ B. Nesbitt, Nurse, resigned on 15.7.17.

DEATH:—

Sister A. M. Poulter, Nurse, died at sea, on the occasion of the sinking of the s.s. “Apapa.”

NON-COMMISSIONED OFFICERS:—

2 Staff Sergeants.

10 Sergeants.

APPOINTMENTS:—Nil.

PROMOTION:—

Sergt. F. H. Plaum, promoted Staff Sergeant on 1.6.17.

RE-ABSORPTION:—

Sergt. H. Chipchase, R.A.M.C., on 25.11.17.

The following Non-Commissioned Officers, R.A.M.C., served with the Military Forces in East Africa, viz:—

Sergt. J. Meason
 „ I. E. Kelliher
 „ H. A. Baigent
 „ C. M. O'Bergin

Sergt. N. W. J. Turnbull
 „ T. W. G. Rogers
 „ A. Pretious
 „ Sergt. H. Blair.

The Clerical Staff consisted of:—

NATIVE.

4 First-class Clerks.
 3 Second-class Clerks.

APPOINTMENT:—

T. R. Mullen, First class Clerk, on transfer from Political Department on 3.10.17.

TRANSFER:—

D. E. Johnson, First-class Clerk, to Political Department, on 3.10.17.

DISPENSING STAFF:—

3 First-class Dispensers.

8 Second class Dispensers.

HOSPITALS AND DISPENSARIES STAFF:—

4 Ward-Masters.
15 Head-Dressers.
10 Dressers.
4 Cooks.
4 Head Ward-Servants.
10 Ward-Servants.
8 Personal Servants to European Nursing Sisters.
4 Messengers.
15 Dispensary Attendants.
3 Medical Orderlies.
1 Storeman.

The Sanitary Staff consisted of:—

(a) EUROPEAN.

1 Senior Sanitary Officer.
1 Sanitary Officer.

(b) NATIVE.

1 Second-class Clerk.
3 Inspectors of Nuisances.
1 Laboratory Attendant.
2 Mallamai Pupil Inspectors of Nuisances.

FINANCIAL.

			£	s.	d.
The total Revenue was	...	...	1,277	16	7

EXPENDITURE.

Personal Emoluments...	...	...	26,179	14	3
Other Charges	...	...	9,201	8	2
Total	...	...	<u>35,381</u>	<u>2</u>	<u>5</u>

II.—PUBLIC HEALTH.

(a).—GENERAL REMARKS.

The transference of the capital of the Northern Provinces from Zungeru to Kaduna, which was completed early in the year, has already received justification, the change having exercised a distinctly beneficial effect on the health of those members of the staff located at Headquarters. The improvement will, I have no hesitation in saying, become more marked as further development becomes possible.

It will appear that the general health of both Europeans and Natives has not been quite as good as in 1916.

During the year the number of Europeans who have required medical treatment has risen 50% which is no doubt due, at any rate to some extent, to the necessarily extended tours of many Officers. The number of deaths has increased and the mortality rate has risen to 23·1.

There has been a gratifying increase in the number of native patients who have sought medical aid, the records showing the number treated to be 27% greater than in the previous year.

During the year nineteen Europeans died in the Northern Provinces, the cause of death being as under:--

	Officials.	Non-Officials.
Acute Nephritis ... ..	...	1
Blackwater Fever... ..	...	4
Dysentery ... ..	...	2
Gastritis ... ..	...	1
General Injury	1	...
Hepatitis ... ..	...	1
Pyper Pyrexia	1	...
Malaria	2	...
Neuritis	1	...
Pneumonia ... ..	...	1
Yellow Fever	2	2
	7	12
Total		19

* Not recorded in Table IV.

The number of deaths among natives in hospital was 256, an increase of 29.

INVALIDINGS.

	Officials.	Non-Officials.
Abscess	1	...
Abscess Liver ... ..	...	1
Anaemia	4	...
Apendicitis	2	...
Asthma	1	...
Blackwater Fever... ..	2	...
Cardiac Disease	2	...
Constipation	1	...
Diphtheria	1	...
Debility	5	...
Dysentery	1	1
Dyspepsia	1	...
Gastritis	1	1
Hernia	1	...
Insomnia	2	...
Malaria	5	...
Mental Disease	4	...
Mitral Stenosis	1	...
Neurasthenia	2	...
Neuritis	1	...
Pyrexia of Uncertain Origin	1	1
Rheumatism	2	...
Rheumatic Fever	1	...
Rabies	2	...
Sun Trauma	2	...
Tuberculosis ... ..	...	1
Trypanosomiasis	1	...
Yellow Fever ... ..	...	2
	47	7
Total		54

INSECT-BORNE DISEASES.

Malaria.—The total number of patients reported to have suffered from this affection increased, although not very greatly when considered in proportion to the total cases treated; among Europeans however, while the number has gone up the proportion to total patients treated has diminished.

Blackwater.—It is unfortunately not possible to ascertain the incidence per 1,000 but both the number of patients and the case mortality have decreased.

The proportion of cases of Blackwater to every 100 of Malaria among the European population, which in 1916 was 8.1, has fallen to 5.0.

Yellow Fever.—In August and September there was an outbreak of Yellow Fever in the region adjacent to the Benue river. Of the nine patients—3 Officials and 6 Non-Officials—infected with the disease who came under observation, all were Europeans. Four deaths occurred showing a case mortality of 44%. Very careful investigation was made but no definite instance of the disease occurring in a native was found.

Although this is not the first occasion on which a case of Yellow Fever has been reported in the Northern Provinces yet it is the first time the disease has assumed an epidemic form. A special report has already been submitted on the outbreak.

Trypanosomiasis.—The returns show that nine patients suffering from Sleeping Sickness have been treated during the year two of whom were Europeans; of the latter however one was an old infection.

INFECTIOUS AND EPIDEMIC DISEASES.

Variola.—There has been a very great increase in the number of cases of this affection, reports of outbreaks, which have resulted in a considerable mortality, having been received from almost every part of the country.

Enteric Fever.—This disease has been observed in 15 patients, 3 Europeans and 12 Natives. Recovery has occurred in every instance. At present Officers only submit to anti-Typhoid inoculation on their own initiative.

Dysentery still continues prevalent and has accounted for the deaths of two Europeans during the year.

Tuberculosis.—The number of patients who apply for treatment for this complaint is slowly increasing.

Leprosy.—The treatment of Leprosy has been taken up in a more systematic manner than formerly and the accounts received tend to show that considerable amelioration of the condition of many patients has been brought about.

Venereal Diseases.—Venereal infections have been responsible for 7.7% of the total cases treated which is 1% higher than in the previous year. This increase is, I consider, largely due to the number of men who have come under observation as the result of the war.

HELMINTHIC DISEASES.

Among Helminthic diseases Cestodal infections are by far the most frequent, *Tænia Saginata* being the form usually observed. Of the Nematodes Guinea Worm and *Ankylostomum* are the most common.

(b).—EUROPEAN OFFICIALS. ‡

The general health of the European has not been quite so good as in 1916 but in spite of the epidemic of Yellow Fever the number of deaths from disease has only increased by one.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF EUROPEAN OFFICIALS.

	1916.	1917.
Total number of European officials resident	x	x
Average number resident	x	343
Total number on the sick list... ..	506	760
Total number of days on the sick list	5,257	6,251
Average daily number on the sick list	14·3	17·1
Percentage of sick to average number resident	x	4·9
Average number of days on the sick list to each patient	10·3	8·2
Average sick time to each resident... ..	x	18·2
Total number invalided	27	47
Percentage of invalidings to total number resident	x	x
Percentage of invalidings to average number resident	x	13·7
Total number of deaths	7 *	7†
Percentage of deaths to total number resident	x	x
Percentage of deaths to average number resident	x	2·04

x Figures not available.

* Two of these were not due to disease.

† One of these was not due to disease.

‡ See page 55 for Statistics for whole of Nigeria.

(c).—NATIVE OFFICIALS.

As far as can be ascertained from the records available the health of the Native Officials has continued good.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF NATIVE OFFICIALS.

	1916.	1917.
number of native officials resident	x	x
Average number resident	x	584
Total number on the sick list... ..	588	578
Total number of days on the sick list	3,062	3,465
Average daily number on the sick list	8·3	9·4
Percentage of sick to average number resident	x	1·6
Average number of days to each sick patient	5·2	5·9
Average sick time to each resident... ..	x	5·9
Total number invalided	2	3
Percentage of invalidings to total number resident	x	x
Percentage of invalidings to average number resident	x	·51
Total number of deaths	5	1
Percentage of deaths to total number resident	x	x
Percentage of deaths to average number resident	x	·17

x Figures not available.

(d).—SOLDIERS.

TABLE SHOWING THE SICK AND DEATH RATES OF SOLDIERS.

	1916.	1917.
Average strength of Soldiers	x	1,454
Sick rate per 1,000 of average strength	x	1,702·26
Death rate per 1,000 of average strength	x	13·067

x Figures for 1916 not available.

(e).—POLICE.

TABLE SHOWING THE SICK AND DEATH RATES OF THE NATIVE MEMBERS OF THE GOVERNMENT POLICE FORCE.

	1916.	1917.
Average strength of Police	893	900
Sick rate per 1,000 of average strength ... ..	...	...
Death rate per 1,000 of average strength	8.95	7.77

(f).—PRISONERS.

I regret to have to record that there has been a considerable increase in the death rate during the year.

TABLE SHOWING THE SICK AND DEATH RATES OF PRISONERS IN THE GOVERNMENT PRISONS IN NORTHERN PROVINCES.

	1916.	1917.
Total number of prisoners passed through the Registers ...	2,418	2,486
Daily average number of prisoners	793	825
Sick rate per 1,000	115.7	x
Death rate per 1,000	15.7	27.7

x No record available.

(g).—EUROPEAN NON-OFFICIALS.

TABLE SHOWING INVALIDING AND DEATH RATES OF EUROPEAN NON-OFFICIALS.

	1916.	1917.
Average number of European non-officials resident	412	436
Total number on the sick list	x	265
Total number of days on the sick list	x	2,922
Average daily number on the sick list	x	8
Percentage of sick to average number resident	x	1.8
Average number of days to each sick patient \	x	11
Average sick time to each resident	x	6.7
Total number invalided	7	7
Percentage of invalidings to average number resident	1.6	1.6
Total number of deaths	10 *	12
Percentage of deaths to average number resident	2.4	2.7

x Figures not available.

* One of these was not due to disease.

(h).—GENERAL NATIVE POPULATION.

With the exception of the epidemics of Small Pox which have already been adverted to and which led to a considerable mortality the general health of the Native population has apparently been maintained.

VITAL STATISTICS.

In 1911, the time of the last Census, the Native population was estimated at $9\frac{1}{2}$ millions. The latest estimates however are as follows:—

Males	2,539,813
Females	3,082,333
Children	2,915,223
Total	<u>8,537,369</u>

Records of Births and Deaths among the Europeans and non-European Aliens only are kept.

III.—SANITATION.

(A).—GENERAL REVIEW OF WORK DONE, LAWS PASSED AND PROGRESS MADE.

(I).—ADMINISTRATION.

During 1917, the world-wide war continued to dominate and heavily hamper sanitary activity. The Sanitary Officer was divorced from the normal duties of his office throughout the year; the Senior Sanitary Officer was able to devote only about one half of his time to his own proper sphere exclusively; and depletions in the personnel of the Medical Staff inevitably involved sudden and arbitrary changes and consequent breaches of continuity. Nevertheless, this state of affairs was not without its redeeming features, even in the case of the Sanitary Officers: it resulted in both of them seeing Military Medical service of a mild variety in the French Territoire du Niger across the Northern Border, an experience which taught them some sanitary lessons worth profiting by; it involved their acting themselves as Medical Officers at various stations; and this revision of past experience stimulated their appreciation of the practical sanitary difficulties habitually encountered by the average Medical Officer.

With two exceptions, which shall be dealt with later, Fate was kind to the Northern Provinces, in withholding visitations of epidemic disease.

Prominent physical features of the year were the phenomenally rapid fall of some of the larger rivers, notably the Benue, towards the end of the rains, and the apparently progressive water shrinkage in some of the Northern regions, especially in the region of Sokoto. Touching the shrinkage of water in the North, two schools of Physiography became vocal: the one maintaining that the shrinkage indicated progressive encroachment by the Desert; the other, that it merely signified a periodically recurring dry cycle. As, however, it was admitted that, even if the contention of the latter school were well founded, such a recurring dry cycle was likely to persist throughout an unknown number of generations and render the country concerned an uninhabited wilderness the while, pretty general satisfaction was experienced in consequence of the decision of the Government to push on with the creation of forest reserves. Anything like a pronounced water-shrinkage is a sure source of anxiety to the Sanitary Officer working in a tropical region the resources of which are derived almost exclusively from agriculture and the raising of livestock; for shortage of water means failure of crops, loss of livestock, poverty and underfeeding; and the last two mean consequent disease. Famine once witnessed in a grain-eating country is never likely to be forgotten by an observer: its manifestations are multiform; but the most striking of them all is probably the large number of cases of what, for lack of a better term, may be called traumatic Dysentery.

The internal trade of the country was good; the trade routes were thronged; and the people were prosperous. This state of affairs resulted, despite the *status belli*, in the members of the European mercantile community continuing to extend their landward spheres of activity; whilst this extension, in its turn, called for the laying out of new settlements on sound sanitary lines.

Offensive trades, particularly Fellmongering, continued to call for and to receive constant attention. At present, this industry is one of the most important activities of the country: it is a chronic source of nuisance; but it is a developer of wealth and of general prosperity; and it calls consequently as much for encouragement as it does for regulation...

Careful attention was directed to the wisdom of transferring the inhabitants of certain stations and settlements to less unhealthy spots: this was notably the case at Katagum, whence it was decided to transfer the official population, including the garrison, to a new site near Hadeija, where building operations had been begun before the end of the year; likewise at Umaisha, a tsetse-fly infested settlement on the Benue, whence the inmates of the Lucy Memorial Freed Slaves' Home—some of whom are subsidised by the Government—were transferred in a body to a fly-free area at Wukari.

For obvious reasons, tours made by the Sanitary Officers were more restricted than they had ever been before. This, although unavoidable, was very unfortunate; for, in the Northern Provinces more commonly than in most regions, sanitary activity in the nature of things is bound to assume chiefly the form of the *argumentum ad hominem*. Unforeseen tours, however, undertaken for various reasons by several of the Medical Officers, were attended by considerable landward sanitary activity.

In many parts of the country, small-pox, which usually subsides during the rains, failed to do so during the rainy season of 1917.

The consequence was that the advent of the dry season found this disease raging in epidemic form in various regions, instead of being limited to isolated *endemic foci* as it normally is in the *Autumn*: and the end of the year found it assuming dimensions beyond the power of the attenuated Medical Staff to cope with.

Cases of fever of uncertain origin, but in some respects suggestive of Yellow Fever, having been reported from the region of the valley of the great river, Benue, Dr. W. B. Johnson and the Senior Sanitary Officer were commissioned, early in September, to proceed to that river and investigate. They received a free hand and every available facility was put at their disposal. The entire river, from its confluence with the Niger at Lokoja upwards, together with its tributaries, was closed to passenger traffic for a time. Full reports were rendered in due course by the two officers mentioned; and it seems superfluous to deal with the matter, in extenso, in this one. It may be mentioned, however, that some of the European cases were, in the end, diagnosed as Yellow Fever, that four Europeans died, and that the case mortality was fifty per cent. This was the case mortality given by the Senior Sanitary Officer in his original report; and it is retained in this one for the sake of uniformity. In Dr. Johnson's report, the mortality worked out at a slightly lower figure: and there can be no doubt that his estimate was the correct one; for it was he who undertook the making of the clinical analysis. It was impossible for the two officers to work in collaboration all through; for Dr. Johnson had to leave the Benue a month before his colleague did; the latter brought the later clinical data back to Headquarters with him; and he was obliged to submit his report and hurry off up country on another urgent mission, before Dr. Johnson could possibly complete his share—by far, the more important share—of the work.

The evidence pointed to the remarkable fact that the visitation had not been water-borne; but that, on the contrary, it had been carried along overland trade routes. The facts collected were most interesting—none the less so far not yet having been fully interpreted—; much intelligence, more or less nebulous, was elicited, for the effective sifting of which years of patient observation will be required; the subject of Yellow Fever assumed a new complexion, so far as the Northern Provinces were concerned; the large amount of pick and shovel work remaining to be done in the domain of African pyretology was illustrated afresh; the necessity for constant vigilance unattended by panicky procedure was accentuated; and it was made manifest that, for many years to come, truth would demand for the term, Pyrexia of Uncertain

Origin, a place in the Medical Returns. Little doubt remains in the mind of the present reporter that, disguised by the Hausa terms, Sáaura or Shaura, Mayemma or Bayemma, Yellow Fever has existed—most probably in epidemic, not endemic, form—for an unknown length of time.

Although, as stated in the report for the previous year, the Capital had been transferred from Zungeru to Kaduna at the end of 1916, during the year now under review, Zungeru remained—and that increasingly so—a very important station. A large military training centre was established there; and the official population—made up of the soldiery with their European commissioned and non-commissioned officers, the Medical officer with his satellites and the Overseas Carrier Corps together with the Europeans in charge thereof—was, to say the least, quite as numerous as it ever had been whilst the station was still the Capital.

The new Capital at Kaduna received such attention as was possible with the means available; its temporary piped water-supply was extended and rendered more reliable; a soda-water factory and an ice-plant were established; the site was steadily opened out; much useful planting and drainage were effected; and the laying down of Dhub grass was extended over an ever widening area. A fine new road, connecting Kaduna Capital with Kaduna Junction, was completed; the railway bridge, which spans the river where it separates the two places, was so modified as to render it practicable for cycles and motor-cars; and the journey between the Capital and the Junction became a matter of a few minutes.

The experience of Kaduna as Headquarters, throughout the year, justified the expectations with which it had been occupied; all concerned found that they could overtake the day's work with less sense of fatigue and take on recreation thereafter with greater avidity than had been their norm at Zungeru; and the possibilities of the place, so much greater than those of the old Capital, conferred upon the community, particularly the younger members of it, a pleasing sense of something to look forward to.

The larger stations—Lokoja, Kano, Zaria, Minna and the like—received their just share of the attention available; if changes for the better were not effected thereat, at least, their established routine was maintained; and the amenities of most of the permanently occupied stations were added to appreciably, if not ambitiously. Some of the smaller landward stations were only occupied intermittently during the year, or were not occupied at all.

As hinted above, the purely Native towns received much less attention than was their due.

During the year, a large proportion of the military personnel was absent on active service north of Nigeria. The women left behind by the soldiery added materially to the sanitary difficulties of every place where they were quartered in any numbers.

The increased use of motor transport demanded and secured the maintenance and extension of the trunk roads, always a highly desirable sanitary activity: whilst the increasing possibilities of motor transport, constantly being realised, indicated one means by the using of which some of the unavoidable sanitary arrears might be overtaken after the war. The possibility of effecting in seven days sanitary missions which absorb a month under existing conditions affords the prospect of materially augmented achievement in the future.

Legislation.

- (1) The Public Health Ordinance, 1917: enacted 20th July, 1917.
- (2) The Vaccination Ordinance, 1917: enacted 8th November, 1917.
- (3) The Diseases of Animals Ordinance, 1917: enacted 25th October, 1917.
- (4) The Townships Ordinance, 1917: enacted 5th July, 1917.
- (5) The Markets Ordinance, 1917: enacted 5th July, 1917.
- (6) The Births, Deaths and Burials Ordinance, 1917: enacted 30th August, 1917.
- (7) Rules, under the Public Health Ordinance, 1917, were made on the 27th July, 1917.
- (8) Rules, under the Townships Ordinance, 1917, were made on the 15th August, 1917.
- (9) Regulations under the Lunacy Ordinance, 1916, were made on the 16th February, 1917.
- (10) Regulations, under the Leper Ordinance, 1916, were made on 16th February, 1917.
- (11) Regulations, under the Quarantine Ordinance, 1916, were made on the 10th August, 1917.
- (12) Regulations, under the Births, Deaths and Burials Ordinance, 1917, were made on the 4th October, 1917.

Progress made.

The Ordinances enumerated under the previous heading, together with the Rules and Regulations made under them, are instruments by the use of which solid and enduring progress is destined to be made: in fact, in the province of Public Health and Sanitation, they constitute by far the most substantial move forward which has been effected hitherto in the history of Nigeria; and they demonstrate how beneficent are the results which attend the devotion of patience and foresight by an Administration to the incorporation of scientific principles with its code of Law.

In a country, such as Nigeria is, whose inhabitants differ widely among themselves in race, in manners and customs and traditions and cults, and in degrees of civilisation, it would be impossible to devise legislation for sanitary and kindred purposes, take it in toto and apply it universally. The most useful feature of the legislation now under review is that it is humanistic as well as scientific: not all of it is of universal application, or to take effect immediately; and it may be applied either in whole or in part only, in conformity with the indications of wisdom and of expediency. "Law's like laudanum; it's much more easy to use it as a quack does, than to learn to apply it like a physician": this well known saying is particularly true of the application of Sanitary Law in Nigeria.

Of course, the legislation cannot be expected to effect sanitary reform with revolutionary speed: it is not professed that it is a "Morrison's Pill"; but, applied with caution and with moderation, it is certain to effect steadily increasing progress, the evidence of which will be recorded in future reports.

The manner in which it is likely to affect favourably the Northern Provinces will now be set forth so briefly as possible. In considering the application of Sanitary Law within the Northern Provinces, it must never be forgotten that, by far, the greater area and greater population concerned are administered indirectly. Direct administration is confined almost entirely to the Townships and to other non-native settlements and reservations which have not yet attained the standing of Townships of one of the three classes under which Townships are described.

The entire country with its cities, towns and villages, outside of the marches of the directly administered areas just alluded to, is under the various indigenous Native Administrations: and, in many respects, the directly differ with the indirectly administered areas more drastically than does London with the Outer Hebrides; for the difference is one of essence, not of degree. Again, the indirectly administered localities differ widely among themselves: and it may be taken as the rule, that the more highly developed an indirectly administered community is, the more purely indirect is its administration. It follows from this that Sanitary Law cannot be applied in precisely the same manner, or often to the same extent, to an indirectly as to a directly administered area or community: even, were it wise and expedient so to apply it, the necessary machinery would be lacking.

The Public Health Ordinance, 1917.

Section 2 of this Ordinance specifies its application thus:—

- “(1) This Ordinance shall apply to and be in force in every
“Township of the First and Second class.
- “(2) The Governor may by Order in Council apply all or any of
“the provisions of this Ordinance or any rule made under
“this Ordinance to any area or place defined in such order.
- “(3) Whenever any of the provisions of this Ordinance or any
“rule is applied to any area or place, all penal and other
“ancillary provisions applicable for the due enforcement of
“such provisions and rules shall be deemed to be applied
“and be in force.”

There are no Townships of the First class within the Northern Provinces. Clause (2) of this section constitutes a “Declaratory Act”; for it lays down clearly that the Ordinance has been enacted to suit the people and not to mould the people in one uniform pattern to suit the Ordinance. People who reside in townships do so voluntarily; they know that if they settle in townships they are bound to conform with all laws, bye-laws, rules and regulations applicable to the townships, whether or not the code may suit their manners, customs, traditions, religion, etc., and, if they find the code intolerable or unsuitable, they have the remedy in their own hands—they may cease to reside in townships.

Townships are not protected: they are colonised; so likewise are those settlements and reservations which are directly administered but which have not been declared townships; and it is equitable that the inhabitants of British Colonies be obliged to conform with British Law, manners and customs. Any Ordinance drawn up from the British point of view, therefore, may be enacted and applied in toto, with perfect propriety, to any British Colony; but the same principle does not necessarily hold good in the case of a British Protectorate. Now the entire area of the Northern Provinces, outside of the limited colonised areas alluded to above, is a protectorate, not a colony: and it is not equitable to compel the indigenous natives thereof to conform in toto with British law, manners and customs. For example, to eat rancid fish is not a crime; rancid fish ranks as a delicacy with many Natives of the Northern Provinces; and to forbid its use as an article of their dietary would be high-handed and unjustifiable. But, to the European, rancid fish within smelling distance of him is a nuisance and it can be regarded as such within the meaning of the Ordinance; and it follows from this that practically nobody within a township or similarly restricted area is at liberty to consume rancid fish. If, however, the Ordinance were applied in toto to the Northern Provinces universally, it would mean the absolute prohibition of rancid fish as an article of food among any community therein: a form of procedure which would be quite as unjust as would be the proscription of high game in England. If a non-native be offended by rancid fish, he need not reside in a native community: as a matter of fact he may not do so legally.

Again, at many of the mud-built mosques throughout the country, a prominent feature takes the form of little niches for the storing of ablution water. Mosquito larvæ are very frequently present in such accumulation of water, which, in a township or similar colony, would be dealt with summarily under section 7, Clause (4) of the Ordinance: and the Mohammedans concerned would have no grievance; they having erected their mosque voluntarily within an area to which the section was applicable. But it would not be expedient to apply this procedure to all mosques in indigenous Native Towns. Were it found necessary to apply the Ordinance to all mosques without exception, the application would have to be effected in an exceptionally tactful and prudent manner; and, for this purpose, the procedure would have to be prescribed by rule. Such a rule or rules may be made by the Governor and, with his consent, bye-laws for the same purpose may be made by a Native Administration, under section 45, Clause 13, of the Ordinance.

Many more examples could be given of the wisdom and expediency of making the Ordinance elastic in its application; but to give more would merely be dotting ii, and stroking tt.

Section 3 is devoted to Definitions: and Infectious Disease is defined thus:—

“‘Infectious Disease’ in relation to human beings, means plague, cholera, yellow fever, small pox, cerebro-spinal meningitis, diphtheria, scarlet fever, typhoid, and sleeping sickness, *and includes any disease of an infectious or contagious nature which the Governor may by public notice declare to be an infectious disease within the meaning of this Ordinance.*”
The italics are the present reporter’s.

Clause 2 of this section provides that: “All terms defined in the Townships Ordinance, 1917, shall in this Ordinance have the meaning assigned to those terms by the said Townships Ordinance, 1917.” This clause is a vital one; for, *qua* Townships, the two Ordinances constitute, as it were, the opposite sides of the same shield.

The italicised portion of the definition of Infectious Disease, given above is vital for it provides the necessary machinery for coping with the sudden outbreak of any contagious disease hitherto unknown or unexpected in Nigeria.

The powers conferred upon the Health and Sanitary Officers and officials are ample and are defined with admirable clearness and precision. For example, still under section 3 is the following definition:

“‘Health Officer’ includes a Medical Officer of Health, a Sanitary Inspector or other person acting under the authority, whether general or special, of the Medical Officer of Health, and whether such Sanitary Inspector or other person is serving in the Medical or Sanitary Departments of the Government or is in the service of a Local Authority or Native Administration.”

Section 4.—“The Governor may appoint any Medical Officer to be the Medical Officer of Health for any area, and in the absence of any such appointment for any area the Medical Officer in medical charge of the area shall be the Medical Officer of Health for the area.”

Section 5.—“Every Sanitary Officer shall be a Medical Officer of Health, and whilst on duty in any place, whether a township or not, shall have power to direct the Sanitary work of such place and to give instructions to all Sanitary Inspectors, whether in the employment of the Government or not.”

Section 6.—"It shall be the duty of every Medical Officer of Health to inspect the areas to which he is appointed and to abate nuisances and otherwise to enforce the powers vested in him relating to Public Health."

Section 54.—"Every Sanitary Inspector while acting as such shall, by virtue of his appointment and without being sworn in, be deemed to be a Police Officer and have all powers and privileges of a Police Officer for the purpose of the execution of his duty under this Ordinance."

Section 55.—"Where any nuisance appears to be wholly or partially caused or contributed to by the acts or defaults of two or more persons including an owner or occupier, any order may be served on one or several or all of such persons, whether in one proceeding or not, and one or several or all such persons may be ordered to abate such nuisance so far as the same appears to the Court to be caused by his or their acts or defaults or may be prohibited from continuing any acts or defaults which the Court finds as a matter of fact contribute to such nuisance, or may be fined or otherwise punished notwithstanding that the acts or defaults of any one of such persons would not separately have caused a nuisance, and the costs may be distributed as to the Court may appear fair and reasonable."

The clearness of definition and absence of ambiguity displayed in the quotations set forth above are characteristic of the whole Ordinance.

What constitutes a nuisance is set forth exhaustively; responsibility therefore is clearly fixed; and no loop-hole is left open for the avoidance of abatement. The Health Officer is entitled on his own initiative to serve an abatement notice on the person—from the first to the last resort—on whom, *qua* the nuisance concerned, responsibility is fixed by the Ordinance; he may also by the same or by another notice require the performance of what is necessary for preventing the recurrence of the nuisance; and, if he deem it desirable, he may, in either case, specify any works to be executed. The Health Officer, further, is endowed with ample rights of entry; in the event of non-compliance with his requirements it is his duty to complain before the Law; and the Court may by making a summary order on the person concerned secure the abatement of the nuisance within a specified time, prohibit the recurrence of the nuisance, specify the work to be executed for the purpose, and, if need be, may by a closing order prohibit any premises from being used for human habitation.

Water and food supplies are jealously safe-guarded: the penalties for fouling water are heavy; and the deposit, preparation, sale and disposal of unsound food for human consumptions are barred by a ring-fence of prohibition, summary destruction and heavy penalty. Any Health Officer or Police Officer, who may shew reasonable cause, may be granted by the Court a warrant to enter any building in which there is reason to believe that unsound food is kept for sale for human consumption, and to search for, seize and carry away any such food; in order that the same be dealt with by the Court. The Court is provided with ample powers for the prevention of the offering of obstruction to the officers alluded to in the performance of their duty.

The cleanliness of streets, thoroughfares and open spaces is amply and systematically provided for: owners or occupiers of tenements are obliged to keep the streets (including the drains, gutters, etc., thereof) abutting on their premises cleared and clean; mutually opposite or adjacent owners or occupiers are responsible for meeting each other

half-way in this activity; and treating thoroughfares, open spaces, and tenements and appurtenances thereof whether occupied or not, as dumping grounds, or committing nuisances therein, are prohibited under adequately deterrent penalty.

The provisions against mosquito breeding are very complete. Health Officers, and any other officers appointed by the Governor for the purpose, are endowed with ample powers, including right of entry; in order that they may be enabled to secure with despatch the destruction of larvae, etc., and: "To take such action as may be necessary to render any accumulations of water unfit to be breeding places for mosquitoes." It is not necessary to go into the provisions at length: suffice it to state that the methods of prevention of mosquito breeding are well known; and that under the Ordinance it is theoretically possible to have mosquito larvae entirely absent throughout townships.

In its provisions for the prevention of Infectious Diseases, the Ordinance may be termed, emphatically, up-to-date. The provisions, whilst effectively comprehensive, are so little harsh and vexatious as efficiency will permit. Their foundation rests on Clause (1) of section 22 which runs as follows:—

"Whenever an infectious disease shall have broken out in any place, the Governor may by public notice declare such place or any portion thereof to be an infected area and may in like manner order the evacuation of the whole or any part of such infected area."

This clause applies to areas under Native Administrations as well as to townships and other directly administered areas. Visitation, notification, isolation, the treatment and apprehension of the infected, of suspects and of contacts, the power to make post mortem examinations of the bodies of deceased suspects and the treatment and disinfection of ships, domiciles and other premises are all thoroughly provided for: so also is the destruction, where deemed necessary in the interest of the Public Health by the Local Authority or by the Medical Officer of Health as the case may be, of buildings, articles including bedding and clothing, and animals. The disposal of the carcasses of animals so destroyed is directed by the Medical Officer of Health concerned.

Heavy penalties are incurred by persons who obstruct, whether actively or passively, the preventive measures provided for by the Ordinance: conversely, compensation for the necessary destruction of property is computed and awarded with equity.

Slaughter Houses, their management and all conditions appertaining to them, the inspection of animals destined for slaughter, the methods of slaughtering together with the considerations both sanitary and humane which are germane thereto, and the regulation of the preparation and sale of meat, constitute a department of public health activity which is still in its infancy throughout the greater part of the Northern Provinces: but the Ordinance provides for the development and expansion of this activity; for, under section 44, the Governor may make rules, and a Native Administration, in respect of an area administered by such administration, may, with the consent of the Governor, make bye-laws for all or any of the purposes thereof.

Section 45 is very properly headed: "Miscellaneous Provisions"; for, under it, the Governor may make rules, and a Native Administration in respect of an area administered by such Administration, may, with the consent of the Governor, make bye-laws with regard to practically the entire ground covered by the term, Sanitation.

Not the least important is section 46; for it constitutes the Governor, a Board of Supervision. Clause (1) of this section runs:—

“No bye-law made by a Local Authority or Native Administration
“under this Ordinance shall come into operation until it has
“been submitted to and approved by the Governor.”

Under various sections, particularly sections 47 to 57 which are headed “Legal Proceedings,” all the legal procedure necessary for the effective working of the Ordinance is provided: above all, no doubt is left touching the source of the funds which are necessary for the carrying out of the recommendations made under the Ordinance by the Medical Officers of Health.

The Rules made under the Ordinance, and mentioned under the heading, Legislation, above, are numerous, comprehensive and give evidence of careful foresight in their making. Part I, consists of twenty-five rules devoted to Infectious Diseases; Part II, of fifteen rules devoted to Slaughter Houses and sale of meat, twenty-one to Sanitation, etc., five to Laundries and Wash-houses, and twelve to Animals; and Part III, of four most useful rules devoted to General Provisions. All the rules are helpful and leave no room for doubt touching what must and what may be done under the Ordinance, or how to set about doing it.

The rules devoted to Infectious Diseases will be particularly useful to future, newly joined Medical Officers who may be called upon to act as Medical Officers of Health, for the first time, during an epidemic of Infectious Disease. The rules devoted to Slaughter Houses, etc., are chiefly applicable to Townships of the first class, no example of which exists in the Northern Provinces. But they present a standard to work up to and there is every hope that the time may be approaching when they shall all be complied with in several Northern Townships.

Many of the rules are hardly applicable to the Northern Provinces at their present stage of development. For example, in the Northern Provinces, there are no licensed private slaughter houses; there are no public manure and night-soil depots; and there are no factories, workshops, breweries, dairies, aerated water manufactories, or public laundries and wash-houses of the nature indicated by the rules.

The twelve rules devoted to Animals are most useful; for, although, within the Northern Provinces, little inconvenience has been experienced from the lack of them hitherto, the time is rapidly approaching when they will be necessary at several places. Particularly useful is the rule which specifies what shall constitute contagious or infectious disease in animals. Equally so are the rules which deal with the management of infected animals, the disposal of infected carcasses, and disinfection in the comprehensive sense of the term. Rule 77 prescribes special methods of disposal for the carcasses of animals infected with (1) Glanders or Farcy; (2) Anthrax; and (3) Rinderpest, and peluro-pneumonia and tuberculosis.

Rule 78 directs that: “All enclosures, fields or areas occupied
“by infected animals and all places where infected animals
“have been buried shall be fenced by the owner thereof and
“no animal shall be permitted to occupy the same for a
“period of two months.”

The Vaccination Ordinance, 1917.

This Ordinance does not, for the present, apply in toto to the Northern Provinces.

Section 6.—"The Governor may, by Order in Council, direct "that, until further order, all adults and children in any area "in the Northern Provinces specified in such order who "cannot produce satisfactory evidence of successful "vaccination or of having been attacked by small-pox shall "be vaccinated."

"An order under this section may be made subject to any "qualifications and exceptions as to the Governor in Council "may seem proper and the provision of sections 8 to 10 shall "be read subject to any such qualifications and exceptions "(if any)."

Section 7.—"When an order has been made under section 6, the "Medical Officer of Health for the area shall appoint the "times and places at which adults may attend and to which "parents may bring children to be vaccinated."

Section 8 deals with the vaccination of adults—persons who are or appear to be 14 years of age or over—in a prescribed area; it prescribes a time limit for each adult concerned; and it lays down the manner in which adults shall attend, primarily and subsequently, in conformity with the procedure indicated under section 7.

Section 9 deals with the vaccination of children—children who are or appear to be under 14 years of age—in a prescribed area; it prescribes a time limit for each child concerned; and it lays down the manner in which parents, or persons having the care or custody of children, shall attend with the children, primarily and subsequently, in conformity with the procedure indicated under section 7.

Section 10 confers upon every public vaccinator and any person acting on the instructions of a public vaccinator, within a prescribed area, right of entry, universal as to place, but limited in the exercise thereof to stated times. This right of entry carries with it the authority to inspect every adult and child found in any premises entered, and thereupon to vaccinate every such adult and child who has neither been previously vaccinated successfully nor already had small-pox.

This section further provides that in the event of an epidemic of small-pox the Medical Officer of Health may order re-vaccination within a prescribed area: in which case, the functionaries alluded to may re-vaccinate any adult or child who having been previously vaccinated shall fail to satisfy them that such vaccination has been within a period of seven years.

Under section 16, the Governor in Council may make regulations prohibiting arm to arm vaccination either generally or in any specified area, and generally for giving effect to the purposes of this Ordinance.

Under the Ordinance, when a vaccination results in marks the areas of which taken together do not amount to half a square inch, that vaccination must be returned as unsuccessful; and, when the marks left by a previous vaccination fail to attain this minimum, the individual bearing them must not be numbered with those persons who have been previously vaccinated.

The Ordinance, so far as it applies to the Northern Provinces, meets their present requirements—requirements, in this connection, is synonymous with possibilities—fully: those of its provisions which have been described above can be complied with in all Townships and other Non-Native Reservations; but it will be some considerable time before the same may be affirmed honestly of the landward regions.

The people in the Townships already may be regarded as a well vaccinated population. This is proven by the fact that, in the annually recurring outbreaks of small-pox, the inmates of the isolation camps in connection with the Townships are chiefly made up of accidental visitors from without.

The Diseases of Animals Ordinance, 1917.

This Ordinance primarily concerns the Chief Veterinary Officer ; but it is so closely allied to the rules devoted to animals, made under the Public Health Ordinance, that it can never be absent for long from the attention of Sanitary Officer.

The Ordinance provides fully measures for the prevention and for the stamping out of these diseases. For example, under it, the Governor-in-Council may make regulations for prohibiting or restricting, generally, or particularly, the importation or exportation of any animal, carcass, hide, skin, hair, wool, litter, fodder or any other thing by means of which disease may be carried ; for regulating the movements of animals within Nigeria ; for the reporting of cases of disease or death amongst animals ; for prohibiting in any place where disease exists the performance of any native custom likely to tend to the dissemination of such disease ; for prescribing the mode of disposal of the carcasses of animals dying from disease ; for the disinfection of persons, clothing, buildings, railway vans and trucks or carriages, wherein any animal shall have been placed, kept or carried ; and, in short, for stopping every legal loop-hole of escape from the provisions of the Ordinance.

A full list of the affections of an infectious or contagious nature, which rank as "disease" under the Ordinance, is given ; and the Governor may by Order in Council declare any other disease of an infectious or contagious nature, an addition to the list.

Live-stock constitutes a very large proportion of the wealth of the Northern Provinces ; diseases of animals are prevalent and often widely disseminated therein ; and the Ordinance is likely to secure results of great economic value. This, however, is not the direction in which it is of interest to the Sanitary Officer. It is, and has been for more than a generation, a recognised fact, that veterinary and human medicine respectively lose half their usefulness, if they do not work hand in hand. Apart altogether from the fact that live-stock may convey disease to man, the Veterinary Officer will often hear the first news of disease among animals from the Health Officer who may have encountered it in the course of inspection of meat ; whilst the latter will very frequently be indebted to his veterinary colleague for timely hints of great value in the maintenance of the Public Health. It is useless to labour this highly important but very obvious point.

The direct effect of the Ordinance will be seen in the stamping out and prevention of much disease ; the indirect effect will be seen in augmented knowledge of parasitology, which will eventually result in the stamping out and prevention of still more.

The Townships Ordinance, 1917.

Section 3.—"The Governor may by Order in Council—"

- "(a) declare any area or place to be a Township ;
- "(b) define the limits of a Township ;
- "(c) declare whether a Township shall be of the First,
"Second or Third Class ;
- "(d) direct that any area or place declared to be a Township
"shall cease to be a Township ;

- “(e) alter the limits or classification of a Township ;
- “(f) declare any area, defined in such order, adjacent to a Township to be an Urban District ;
- “(g) authorise and require the Local Authority of a Township
“to exercise and perform within the limits of the Urban
“District, all or any of the powers and duties which the
“Local Authority is authorised or required to exercise
“or perform within the limits of a Township ;
- “(h) apply all or any of the bye-laws or rules in force in any
“Township to any Urban District.”

Section 4.—“The limits of a Township or of an Urban District may
“be defined by reference to a plan signed by the Governor
“and deposited in the office of the Surveyor-General. In
“such case a copy of such plan certified by the Surveyor-
“General shall be deposited by the Surveyor-General with
“the Local Authority, as established under this Ordinance,
“and such copy shall be admissible in evidence in any legal
“proceedings.”

This Ordinance, in so far as it affects First Class Townships, has no application to the Northern Provinces, wherein no First Class Township has been declared.

The areas declared Townships, within the Northern Provinces, are all of them either of the Second, or of the Third Class. It does not appear to be desirable or necessary to go into the legal points of this Ordinance further than to show how the internal economy of the Townships will touch their sanitation. But it does seem expedient to quote section 28 ; for a Township of any class is managed by a Local Authority ; in First Class Townships alone, does the Local Authority take the form of a Town Council ; this section shows what a Town Council may do in the way of making bye-laws ; and machinery exists for the purpose of making section 28, applicable to Townships of the Second and Third Class, in so far as the practical bearing of it is concerned.

Section 28 runs as follows :—

- “(1) A Council may make bye-laws for all or any of the
“purposes following :—
- “(a) Imposing fees and charges, for services rendered,
“licences and permits issued and other things done by
“the Council, and providing for the collection thereof.
- “(b) Prohibiting or regulating the hawking of wares, or the
“erection of stalls on or near any street.
- “(c) For the management and control of pounds and
“prescribing the powers and duties of pound masters.
- “(d) For the seizing and impounding of stray animals and
“for the recovery of the expenses incurred in connexion
“therewith.
- “(e) For the sale of impounded animals and for the disposal
“of the proceeds of such sale.
- “(f) Regulating the traffic on any street.
- “(g) Regulating the use by the public of any public recrea-
“tion ground or open space vested in or controlled by
“the Council.
- “(h) Prohibiting the erection of any new building, unless and
“until the plans thereof have been submitted to, and
“approved by, the Council, and generally regulating the
“erection of new buildings.

- “(i) Prohibiting or regulating the use in any defined area of
“any inflammable material for building or roofing
“purposes.
 - “(j) Providing for the registration of persons residing in the
“Township or in any part thereof.
 - “(k) Regulating the carrying on of any offensive trade,
 - “(l) For the prevention of fires.
 - “(m) For the establishment of Fire Brigades and prescribing
“the duties of members of such brigades and generally in
“connexion with any matters relating to the extinguishing
“of fires and to the custody and use of appliances
“provided for such purpose.
 - “(n) Licensing carriages, carts, cycles, rickshaws, and all
“other vehicles whatsoever whether private or plying or
“working for hire.
 - “(o) Prescribing the powers and duties of persons employed
“by the Council and conferring on persons whose duty it
“may be to prevent the breach of any bye-law the power
“to arrest persons found offending against such bye-law.
 - “(p) Generally for the health, order and good government of
“the Township, and for carrying into effect the provisions
“of this Ordinance and of any Ordinance which the
“Council is required or authorised to administer.
- “(2) No bye-law shall be published in the Gazette or shall come
“into operation until it has been approved by the Governor.”

In Townships of the Second Class the Local Authority is vested in an Executive Officer who is a corporation sole. “By the name of
“the Local Authority for the particular Township for which he is
“appointed or acting and by such name shall have perpetual succession
“with capacity in that name to acquire and hold property moveable or
“immoveable, to sue and be sued, to take criminal proceedings, to
“execute deeds, using an official seal, to enter into engagements binding
“on himself and his successors in office, and to do all other acts
“necessary or expedient to be done in the execution of his office but
“such Local Authority shall not sell, mortgage, alienate or lease any
“immoveable property without the consent of the Governor first
“obtained.”

For every Township of the Second Class, an Advisory Board is established.

This Board consists of certain *ex-officio* members, of whom the Health Officer is one, and of such other members, if any, as the Governor may appoint. The Local Authority is himself the Chairman of this Board; he keeps, or causes to be kept, the minutes of the meetings thereof; it is his duty to send the minutes to the Lieutenant-Governor; and provision is made for the regular, periodical meetings of the Board.

The Local Authority of a Township of the Third Class is a Public Officer appointed, by general or special order of the Governor, to carry out the duties and exercised the powers thereof.

The present reporter has himself been present at a meeting of the Board of a Township of the Second Class, throughout the proceedings, and is most favourably impressed by the useful influence which such Boards possess and may consequently wield. It so happened that the consideration of the estimates for the succeeding year constituted the chief part of the agenda, at the meeting in question. Every point was

gone into thoroughly; neither words nor time were wasted, for each member was perfectly acquainted with local needs and conditions and had no personal axe to grind; each member represented his views without reserve and without passion; a common sense finding was the result; and the present scribe left the meeting with the feeling that the best way to secure unbiassed and effective work by a Board would be to keep its proceedings out of the local press—an institution whose blessings have not, so far, been conferred upon the Northern Provinces.

In a country such as the Northern Provinces, sanitary considerations have, in the nature of things, to absorb a large portion of the attention of any Local Authority. In addition to this, any topographical activity or building operation inevitably brings sanitary questions into view; the Health Officer, although not an Executive Officer, wields great influence in his advisory capacity; and his influence often secures the avoidance of the practice of false economy in the effecting of sanitary activity; for, just as the longest way round is often the shortest way thither, so bitter experience has taught that the remedy is much more expensive, in the end, than is the avoidance of sanitary errors.

In British possessions, to attempt *ad infinitum* to run strictly local affairs (of which sanitation is generally the chief) from executive or administrative headquarters is not in harmony with tradition: sooner or latter a time comes when, even in the newest possessions, local settlements must be entrusted with such of their affairs as are essentially local, for the management thereof by themselves; such a time has been reached in the Northern Provinces; and the legislation, now under consideration, is the result.

Local management of affairs connotes the levy of local rates and other financial devices for covering the cost of management. This bed-rock truth has not been lost sight of in the Townships Ordinance; and the Local Authorities have not been endowed with their powers without the ability to put hands on the means necessary for the exercise thereof.

Just as when, in England, a civic authority whether urban or rural may neglect to exercise its powers the Local Government Board may take them over and entrust them to another authority, so, in the Northern Provinces, a Local Authority whether a Council or a corporation sole cannot become a man-of-straw without the powers thereof being resumed by the Board of Supervision; the Governor, to wit

It has been shown above, under section 3, that the Governor may, by Order in Council, declare any area or place to be a Township. But, before the Governor does so in practice the following stereotyped procedure is followed and is the rule:—The area which it is proposed shall be declared a Township is first of all set out by the Department of Surveys working in concert with the Senior Sanitary Officer who selects the various quarters, localities, reservations, open spaces, etc., and their relative positions within the Township boundary.

Now certain invariable conditions are accepted as common to all new Townships.

These may be enumerated as follows:—

- (1). The European Reservation shall be separated from the Non-European Reservation by a Neutral Zone having a minimum breadth of 440 yards, or two furlongs.
- (2). No residential building shall be permitted on the area known as the Neutral Zone, under any pretext or circumstances whatsoever.
- (3). The European Reservation shall be completely surrounded by a ring-fence of Neutral Zone of a minimum breadth of 440 yards.

- (4). The two Reservations, European and Non-European, together with the Neutral Zone, the Market, Public Buildings, Factories, Banks, Stores, etc., are all included within the Township Boundary; but the European Reservation cannot approach the Township Boundary by less than two furlongs; for it is surrounded by the Neutral Zone, which itself is within the Township Boundary.
- (5). All European trading sites, on which Europeans reside, must be situated within the European Reservation: and all trading sites, on which Non-Europeans (other than *bona fide* domestic servants of Europeans) reside, must be situated within the Non-European Reservation.
- (6). Non-residential buildings, such as Court Houses, Club Houses, Places of Worship and the like, and parade-grounds, gardens, recreation grounds and even cemeteries, may be permitted on the Neutral Zone at the discretion of the Governor.

A town or site plan complying with the conditions set forth above is then prepared in the Surveys Office and submitted to the Governor. The Governor very often has amendments made: for example, if he think one or both of the Reservations too small or unduly large, he directs amendments to be made accordingly; and, if he deem the scope left for expansion in one or more directions inadequate, he earmarks one or more areas beyond the Neutral Zone, or Boundary, for ultimate declaration as an Urban District or as Urban Districts.

It will be seen that it follows from this that no European within the Township may legally reside (and, consequently, sleep) within two furlongs of a Non-European—domestic servants alone excepted.

Having satisfied himself that the plan submitted fulfils the indispensable conditions and, if he approve of the relative lay-out so far as non-essential conditions are concerned besides, the Governor signifies his final approval by signing the plan; it becomes the authorised plan and is deposited in conformity with section 4 of the Ordinance; and then, and not till then, is the area declared to be a Township.

Now to call the Ordinance together with this procedure under it the Europeans' Sanitary Magna Charta is no gushing exaggeration. The procedure has been aimed at in the Northern Provinces for over fifteen years and European segregation has always been more generally aimed at herein than in any other part of West Africa: and the result has been seen, *inter alia*, in the very small and isolated incidence of Yellow Fever among the European community; although it is only recently that the chief reason for this result has been fully recognised. At last, the procedure has become the law of the land. It does not indicate the aloofness of caste on the part of the European but it does indicate the aloofness demanded by his physiological idiosyncrasy: for it is well known that the Non-European can tolerate certain mosquito-borne diseases—Yellow Fever and Malarial Fever, *e.g.*,—with comparative safety which are virulently fatal to the European; and, consequently, common prudence demands that the latter shall reside at least a mosquito-flight away from the former.

So far as the present reporter knows, no statistics have ever been collected of the invaliding, the sick and the death rates of West Africans living in the United Kingdom; but he believes them to be high: and he is convinced that, were West African communities settled in the United Kingdom as European communities are in West Africa, they would, in self-defence, be obliged to segregate themselves in like manner; for scarlet fever would probably be as relatively fatal to them as Yellow Fever is to the European.

It is good that the principle should be the law of the land; it is the only defence which the young commercial European has against his firm, if the latter call upon him to reside against a native slum; and the present writer is thankful, for the sake of his countrymen's reputation, that it is never likely to be his lot to give evidence before a Commission enquiring into past casualties directly traceable to the fashion in which Merchants have quartered their European employees—in the comparatively recent past. There is every indication that this part of the world will be the site of a substantial commercial boom after the war; this aspect of the Ordinance is pretty certain to be attacked, on the ground that it is hampering trade; the attack is likely to come from influential quarters; and the sanitarian can only hope that the Government will stick to its guns: for to quarter Europeans against Non-European slums—even the most respectable Non-European quarters are apt to assume the form of slums, from the European point of view: *e.g.*, the sound of mastication is not unhealthy; but it puts the fastidious off their food, all the same—is quite as flagitious as is the torpedoing of hospital ships by Prussian Royalty; and the Ordinance does not forbid an European Merchant to have business premises in a Non-European Reservation, and *vice versa*—residence alone is prescribed by the Ordinance.

The wind which has chiefly to be regarded in the Northern Provinces is an easterly one: during the dry season, it takes the form of the cold dry harmattan from the desert; during the rains, it assumes the form of successions of tornadoes; and, although the general source is easterly, the commonest is E.N.E. A.S.W. wind is often experienced during the rainy season between the tornadoes; but, except in the most southern of the Northern Provinces, it is a very gentle wind and, relatively to the easterly ones, does not count. For this reason, if the surface permit, a township is generally laid out with the European Reservation to the east, the Non-European Reservation to the west and the market to the west of all.

If, however, the township be on a considerable stream and if the stream be the source of the water-supply, the practice is to put the European Reservation furthest up-stream and the market furthest down-stream.

Again, if the township be situated on a pronounced slope, the same relative procedure is followed from up-hill to down-hill.

These three alternative arrangements are not hide-bound in the sense of being laid down by Law; but they are adhered to according to topography, unless there be some exceptional reason why they should not be.

In townships, before buildings can be erected, the plans thereof have to receive formal sanction: this prevents the over-crowding of sites.

Attempts are always made to have buildings—particularly residential ones—oriented correctly where possible. In the greater part of the Northern Provinces, however, the course of the sun is to the south of the straight line from east to west. Were a building, therefore, oriented truly instead of correctly, the result would be that, during, practically two thirds of the year, the sun would run parallel with the southern verandah; for the country lies between the Equator and the Northern Tropic. The general practice aimed at, therefore, is to cant buildings round so that their length lies from E.N.E. to W.S.W. By this arrangement, the sun can only penetrate the eastern end of the southern verandah for a brief space in the early morning; and the western end of the northern one, for a brief space in the afternoon: the lateral walls thus receive a minimum of direct sun-rays.

Also, by this arrangement, if the Eastern verandah be closed in, the entire building receives a maximum amount of protection from the dusty Harmattan and from the Tornadoes with their fiercely driving rain.

Again, when townships are oriented, the main thoroughfares are swept by the powerful winds and bathed in a maximum of sun-light; whilst the filth from the market is blown away from the town.

For primary sanitary requirements, the dry-earth system has always been followed. This is the system aimed at in the townships; it is admirably suited to the nature of the greater part of the country; and, with the means available, no other system can rival it in efficiency.

In townships, all Europeans, together with a greater or smaller section of Non-Europeans, use earth-closets in association with daily trenching of the contents of the buckets or pails. In the few localities where the subsoil water is close to the surface, this system is universal for Europeans and Non-Europeans alike, except a few trenches for public purposes in some of the more primitive places. But, generally, Non-Europeans have the *salga* system: each compound in the Non-European Reservation having at least one *salga*; and, when the source of the water-supply is in wells, no wells are permitted in the compounds, but have to be dug away from the compounds in places appointed by the Health Officer.

As a rule, each European compound contains a properly housed *salga*, with effective cover, for the use of the domestic servants therein.

In addition to all this, there is full provision for public latrines: either of the *salga* or of the earth-closet type; with, very rarely in exceptional places and under exceptional circumstances, screened trenches.

The occupier of each compound, whether in the European or in the native reservation, is obliged to have all the rubbish in the compound collected daily at a spot and after a fashion which will ensure effective removal. Removal is effected by the occupier or by the scavenging staff of the township; but, in either case, removal has to be effected at specified times and disposal has to be effected at places and after the fashion appointed by the Health Officer. The rubbish is disposed of by burial or by incineration; except at Lokoja and at Baro, where a portion of it is dumped in the river Niger.

It has been ruled under the Ordinance that no earth, clay, sand or stone shall be collected from any place within a township for building purposes without the previous sanction of the Local Authority. It has further been ruled under the Public Health Ordinance that no person shall, in any township, make any borrow-pit or excavation for building or other purposes without the approval of the Health Officer which shall be obtained through the Local Authority: and that the Health Officer shall, on giving his approval, fix a suitable place for such borrow-pits and excavations and shall give instructions for filling in or efficiently draining the same. Appropriate penalties are appointed to the breach of their rules under both Ordinances.

The Ordinance reduces the residence, within a township, of vagrants and prostitutes to a minimum: no legal machinery can eliminate them entirely.

All compounds have to be effectively fenced after such fashion as the Local Authority may direct: and the Local Authority in this matter is guided by rules made under the Ordinance.

Within the Northern Provinces, every occupier is bound to keep the Local Authority informed of all persons—himself included—inhabiting his, the occupier's compound: and no person may keep a common

lodging-house or let rooms within a township unless he has first received a permit in writing so to do from the Local Authority. Thus the effective application of the Ordinance can and ought to make overcrowding impossible.

Offensive Trades are effectively regulated: and have, almost entirely, to be conducted at places, generally outside of the township boundary, and under conditions appointed by the Health Officer and intimated by the Local Authority.

THE MARKETS ORDINANCE, 1917.

This Ordinance provides that the Governor, or, with the approval of the Governor, a Local Authority or Native Administration, may establish markets; may provide all such matters and things as may be necessary for the convenient use of the market; may demolish, reconstruct, abolish, close or move any market; appoint Inspectors of Markets; and exact rents, tolls, etc., for right of user. Township markets shall be under the control of the Local Authority, Native Administration markets shall be under the control and management of the Native Administrations which have established them; and all other markets shall be under the control and management of the District Officer or of such other officer as the Governor may appoint.

For or in relation to any market established under this Ordinance or established before the commencement thereof the Governor may make rules, and a Local Authority or Native Administration may make bye-laws of exhaustive and comprehensive scope covering the construction, maintenance, management, regulation, and all activities incidental and essential to the business of markets. Under heavy penalty, no person may establish, maintain, conduct or manage a market, and no owner, lessee or occupier of land may permit a market to be established thereon, without authority obtained under this Ordinance. Under penalty, no person may permit the continuance, take part in the management, or use, whether as buyer or seller, the convenience of any market whatever which has been closed by an order under this Ordinance. This strikes heavily at the small vendors or hawkers of doubtful food who are given to the setting up of miniature markets everywhere.

The Ordinance is essentially complimentary to the Public Health and the Townships Ordinances, particularly the former: for example, rule 39, made under the Public Health Ordinance, directs that no meat shall be exposed for sale except between 6 a.m. and 6 p.m. and that, in places provided with a public market, the sale of meat shall be restricted thereto; whilst rule 40, under the same Ordinance, runs to the effect that; "When the Local Authority, on the representation of the Medical Officer of Health, considers it is in the interests of the public health, it may require that all meat exposed for sale shall be protected from flies by placing it in fly-proof cages which shall be provided by the vendor: the size and construction of such cages shall be according to a pattern approved by the Medical Officer of Health."

As stated in former reports, material progress had been made in the direction of the desideratum set forth in the quotation above, before the enactment of the Ordinance.

Unfortunately, the application of this sound rule will have to remain a dead letter until after the war; for until then, wire gauze will be unobtainable at any price.

THE BIRTHS, DEATHS AND BURIALS ORDINANCE, 1917.

Section. 3.—(1) "Births and Deaths are registrable under this Ordinance in the cases following:—

“(a) All births and deaths occurring amongst non-natives in
“Nigeria or in the territorial waters of Niger.

“(b) All births and deaths occurring amongst Natives in any
“area or territorial waters of Nigeria defined in an Order
“in Council made under subsection (2).

“(2). The Governor may by Order in Council direct that all
“births and deaths occurring amongst natives in an area
“defined in such order shall be registered.”

Section 36.—“The Governor may by Order in Council

“(a) declare any burial ground to be a public burial ground for
any area specified in such order ;

“(b) appropriate any public burial ground to persons of any
“class, nationality or religious denomination mentioned in
“the order ;

“(c) order that any burial ground whether a public burial
“ground or not, named in such order shall from a date
“specified be discontinued either wholly or subject to any
“exceptions or qualifications mentioned in such order.

Section 38.—“When there is a public burial ground for any area

• “no corpse shall be buried in any place within such
“area other than such public burial ground except with
“the consent in writing of the Governor.”

Section 40.—“Except with the consent of a Medical Officer no

“corpse shall be buried at a less distance than four feet
“from the surface of the ground.”

Burials within or in undue proximity to houses are forbidden ; provision is made for the exhumation and re-burial of bodies buried in improper places ; and dwelling houses affected thereby can be closed until they become fit for habitation.

From the Sanitary point of view the Ordinance is of value in affording a good basis on which to compile the vital statistics of Townships ; in preventing the concealment of disease by means of unregistered deaths and unauthorised burial ; in avoiding nuisance liable to arise from imperfectly effected burials and from burials in unsuitable places ; and in avoiding the pollution of wells and streams by decomposing corpses in undue proximity thereto.

Among certain pagan tribes, burial of corpses under the floors of rooms in inhabited houses and within the confines of compounds is a well recognised custom ; such pagans may have bona fide employment in Townships and consequently be entitled to reside therein ; and it is an absolute necessity that it be made impossible for them to observe the custom in question within any Township.

It is not professed that what has been written above is a complete epitome of all that has been enacted ; but it is hoped that the effective instruments which the Ordinances have put at the disposal of the Sanitary Officer may have been indicated with adequate clearness.

The Ordinances are mutually complementary and so nicely are they dovetailed, the one into the other, that escape from reasonable sanitary obligations is rendered a practical impossibility.

The effect of the increasing prosperity was seen in the more generous feeling and progressively improving clothing and housing of the people in many places ; and, whether for good or for evil, a permanent movement towards a higher material standard of living had

obviously set in. The effect of general prosperity on the progress of sanitary development cannot be doubted; in the case of poverty-stricken people, sanitary principles have generally to be imposed from without; but in the case of comfortable, prosperous people, sound sanitary surroundings, at first a luxury, tend rapidly to become a necessity.

The truth of this could be seen in the constant efforts after improved housing in some of the townships; the people concerned being desirous of expending more money on their buildings than was possible, in consequence of the materials desired not being obtainable at any price: and the observer felt justified in contemplating the time when paved or concrete courts, and walls and floors protected against rising dampness and ground-air, should have become the rule in the Townships—an event, until quite recently, relegated to the distant future.

The effect of the war was felt increasingly in the shortage of imported supplies of all kinds. This compelled Europeans to make use of local products to an extent never generally attempted before: and many began to find out, to their surprise, how far it was possible for them to live on the country.

(II)—PREVENTIVE MEASURES.

Mosquito and Insect-Borne Diseases.

MALARIA, YELLOW FEVER AND FILARIASIS.

Those against mosquitoes continue to constitute the most prominent preventive measures practised in the country; the most prominent; because, although, naturally, sanitary activity is applied with equal fidelity to other preventive measures, the danger represented by the presence of the mosquito is the one which has sunk most completely into the general European mind. It is true that the incidence of Malaria tends to maintain a fairly fixed ratio to the diseases of the country as a whole: at first sight, this may seem somewhat disappointing; but, when other preventive measures are remembered, it will be found that there is little or no ground for disappointment. Malaria is undoubtedly the most prevalent disease in the country—of course, leaving out venereal diseases which must always remain a law unto themselves; although the methods of preventing it are perfectly understood, it is more difficult to avoid all sins of omission in the practice of them than is the case in the practice of preventive measures against other diseases; in fact, compared with methods of prevention against Dysentery, for example, those practised against Malaria are on the same principle as is involved in restraining a murderous tribe, whilst those against Dysentery are comparable with the baffling of an individual murderer.

It remains true that the more experienced members of the European Community are infinitely less affected by Malaria than was the case formerly: it takes toll chiefly of the younger and less experienced. But their lack of experience and possible carelessness do not account entirely for its heavier incidence among the young: as a rule, the younger members of the community endure most exposure; for they do most of the travelling and, consequently, pass most time in undesirable situations which are but rarely visited and not constantly dealt with.

The effect of routine preventive measures is easily seen in the larger and more oldly established stations: in them by far the larger number of cases of Malaria observed is made up of importations from

without; and, among the non-medical members of the permanent European population of such stations, an attack of Malaria on one of their number tends more and more to elicit a rebuke for carelessness than an expression of sympathy. One of the results of the war has been a pronounced shortage of Quinine in tabloid form. This has resulted in the general issue of the drug in solution; many have taken it in this form for the first time in their experience; and it is hoped that the majority of those alluded to will continue the practice permanently.

During the year, an ugly tendency was noted here and there among the younger Europeans, to argue against the habitual taking of Quinine; on the ground that the practice was unscientific and that the necessity for it, if genuine, merely showed failure to apply sounder measures of prevention. This was undoubtedly traceable to certain academic medical discussions at home, the echo of which had reached the lay press. Unfortunate experience will, no doubt, bring it home in due course, to the people concerned, that the Northern Provinces of Nigeria do not yet constitute a plantation in a ring fence, well and expensively run and enjoying abundant labour together with European supervision of every acre.

It is unfortunate that the impossibility of obtaining the necessary material will preclude the extension of the piping of water until after the close of the war.

During the outbreak, alluded to above, in the Autumn, in the Benue region, a very effective method of dealing with domestic mosquitoes, especially in mud huts with thatched roofs, was practised. The method is to take a large native pot drill a dozen holes or so of the diameter of a pencil or penholder in the bottom thereof, mount the pot on three stones, line the bottom of the pot with a layer of stones, above the stones make a good fire of charcoal, on the glowing charcoal pile broken-up dry native tobacco to within six inches of the brim of the pot, and, lastly, put on the top of the tobacco a paper bag full of black native pepper. Of course, before arranging the prepared pots, all the apertures of the hut or room are closed, with the exception of one for the egress of the operator. So soon as the bag of black pepper has been deposited, the operator blots out and closes the remaining aperture. In an incredibly short time, not more than ten or fifteen minutes, the room becomes filled with dense, dark, pungent smoke. The room must be left alone for twenty-four hours. On opening, and entering it when this becomes possible, the observer finds that all insects—mosquitoes, flies, cockroaches, earwigs and the like—have fallen on the floor, dead or unconscious. A beating of the outside of the thatch dislodges insects left entangled in the grass. The floor is then swept and all the sweepings are conducted promptly to a good fire. This method is cheap and effective; the materials are obtainable nearly everywhere; the native takes to it readily, appreciates it and works it easily; and one average native pot of the larger variety will deal quite successfully with about 1,800 cubic feet. The method was devised some ten or twelve years ago by an ingenious political officer, then residing in Bornu.

Of course, where Yellow Fever has been in a thatched house, the proper procedure is to put a match to the roof: this is all right, if the house be an isolated one; but is often out of the question on account of the danger of burning down an entire town.

Since the Benue episode, the standing wash-places, constructed on the model of those in the state-rooms of ocean-going steamers, in the cabins aboard all Government steamers on the rivers have been disestablished.

Filariasis is not often observed in Europeans: no case was recorded in 1917. It is quite common among many of the Natives; but only a very minute fraction of its incidence comes under observation. It has been mentioned in former reports that, more often than not, *Filariasis* is observed when a patient happens to come under treatment for some other ailment: and this statement may still be made.

There are very few parts of the country, if any, where the casual observer will fail to note cases of *Elephantiasis* on any day in the course of which he may traverse a native town or Quarter.

Trypanosomiasis.—*Trypanosomiasis* is always being reported from time to time. During the year, two Europeans and seven Natives were treated for this disease. Probably every European case comes to light sooner or later: it can hardly be otherwise; considering the careful attention which Europeans receive, both in Nigeria and at home. But the number—seven—given for Natives is not of the slightest use for statistical purposes. Taking the safely conservative hypothesis that the incidence of *Trypanosomiasis* is twice as great among Native as it is among European communities, 16,000 is much liker the probable truth. Of course, it has to be remembered that, as a general rule, it may be taken as true that *Trypanosomiasis* is a disease of remote backward tribes, that, in contact with such tribes, the proportion of Europeans to Natives is much less than it is in the case of the more highly civilised races among which the disease is rare, and that consequently, given the true incidence among Europeans, the incidence among Natives cannot be calculated by a simple rule of three; but, bearing in mind the cautious supposition on which it is based, the probability stated above is not likely to be very wide of the mark.

The precautions taken against the tsetse-fly are continually active and are only limited by the means available. One remarkable fact about the disease is that one seldom hears about it occurring among the nomadic aquatic people who are constantly traversing fly-infested stretches of river and stream. The people in question belong chiefly to the Nupe and Kakanda races. The majority of them is made up of private traders and carriers who work their own Native craft; but they are employed in fair numbers on Government and Mercantile steamers and other European vessels. Now, those people have been in close contact with European influence ever since Europeans came to this region and, as they are not backward in seeking European medical aid for their ordinary ailments, it is strange that *Trypanosomiasis* is not observed among them fairly frequently. They probably know the disease quite well and share the inveterate Native habit of concealing it. The stationary people in sleeping-sickness regions, of course, conceal it; but, sooner or later—generally rather later than sooner—they cannot conceal the fact that their people are steadily dying: and investigation is consequently directed thereto.

Instances of tsetse-flies being active by night are being reported with increasing frequency: this is probably merely the result of an increasing amount of country being traversed by an increasing number of Europeans and the fly being looked for more carefully and observed more closely than it was formerly. But the tsetse-fly is a most puzzling insect and its apparent changes of fashion often lead one to feel that nothing but a lifetime devoted exclusively to hunting in its haunts can fathom it completely.

Every year confirms the belief in the efficacy of broad cleared roads as a preventive measure against tsetse-fly: and this is a measure which is bound to progress; for every indication points to widely spread exploitation of the country's resources after the war.

INFECTIOUS AND EPIDEMIC DISEASES.

Cerebro-Spinal Fever, although very little observed, was probably extensively prevalent in some parts of the North. Early in November, the Senior Sanitary Officer heard, from Native acquaintances, most circumstantial accounts of its prevalence in the Kano neighbourhood. Shortly afterwards, having occasion to proceed to Kano and thence to Hadeija, he made, with the kind assistance of Political and Educational colleagues, inquiries at Kano and at Hadeija—in the latter city, consulting the Emir himself—and at the towns along the road between the two; but, although he concluded to his own satisfaction that the disease had been and probably still was prevalent, he failed to observe a single case. This is only another example of how often chasing a disease is pursuing a Will-o-the-wisp: a Native may tell one that a disease is prevalent in a certain town; the town, although two hundred miles away, may be the Native's own town and his statement may be quite true; one may proceed to the town to investigate; and not a single case may be found. The people will not give one another away; and probably the original Native informer would not give the information, were he himself in the town at the time.

In regard to disease, the Native is very like a certain type of European who will state quite freely that much sharp practice is conducted in a given town, declining at the same time to name a single shifty person in it: and the average Native would resent the charge of being shifty much less than he would the imputation of being sick.

Dysentery was very prevalent during the year: the Amoebic form being much more frequently observed than the Bacillary. Enormous numbers of people up and down the country are carriers.

Enteric Fever maintains the footing which it has acquired; and it is greatly to be feared that the number of its carriers is increasing by leaps and bounds. West African Natives constitute a particularly dangerous type of Dysenteric and Enteric carrier: they are themselves so tolerant of abdominal affections that they, not infrequently, can carry on easily whilst in a condition which would inevitably prostrate any European.

Pneumonia and Influenza are exceedingly common everywhere and may be numbered with the endemic diseases which account for vague reports of "outbreaks of sickness" forthcoming from lay sources. Were it not for the very brief course so often run by Pneumonia, many more cases of the disease would be admitted to the Native Hospitals. A large proportion of the cases which are admitted comes from among the Soldiery and Police; for with them, a very brief prostration means failure to appear on parade and consequent reporting sick.

Tuberculosis although not very widely disseminated, obtrudes itself on the observer with painful regularity. It is showing its ugly presence amongst the Arabs of the North, in whom it was unknown until quite recently, so far as the present reporter has been able to discover.

Leprosy does not afford scope, as things are at present, for much beyond platitude. But ambitious projects are under consideration: some of them will doubtless materialise, what time the personnel of the Medical Staff shall have regained its pristine dimensions.

Measles was very prevalent up and down the country during the year, although very few cases of it found their way to Hospital. Cutaneous affections in black people are often apt to be very puzzling and, not infrequently, baffle the observer entirely. Among such affections may be mentioned a measly rash which occurs among the

indigenous Natives during the Harmattan—cold weather. This rash does not appear to be attended by rise of temperature; it appears chiefly on the face—over the Zygomata, and the lower maxillae; in considering it, Measles, Secondary Syphilis, and Chilblains have to be excluded; there is no sensation associated with it; and it seems to run a course of from a fortnight to two months. The sufferers from it almost invariably state that it has recurred with them every few years, since childhood, at the cold season; they do not complain; and they only advert to it when an European, having observed it, questions them. A brisk purge appears to be the only treatment which does any good; but it is quite possible that the evidence in favour of the purge may be born of confounding the post with the propter. The evidence is strongly against it's being a "filth" disease. Of course, it is only fair to add that he is a very brave—or very rash—observer who will exclude syphilis absolutely in any non-pagan Native.

Rheumatism, acute and sub-acute, is widely prevalent and valvular disease of the Heart is very common: so also is chronic Rheumatism. In many cases of sub-acute Rheumatism, it is difficult to exclude Gonorrhoea: in most cases of the chronic variety, it cannot be excluded.

Rabies appears to be pretty common among dogs, although of all the dogs alleged to be rabid, which have been submitted to the present reporter, none has been so. The Natives talk without reserve about Rabies, both in human beings and in dogs: and they seem to know it well and to be fairly familiar with it's recognised symptoms. Europeans, alleged to have been bitten by rabid dogs, are sent for Pasteur treatment; but, when a dog is said to be rabid, he is much too apt to be destroyed before the pronouncement has been verified.

Tetanus must be much more fatal than is Rabies; for, as mentioned in the last report, the Natives are terrified to name it: in fact, it is only very recently that Europeans, speaking the language well, have become aware of the Hausa name for the disease.

In light of this, it is not surprising that Europeans rarely see a case: but constant reason for inferring its existence keeps cropping up; and the average European loses no time in applying Iodine to his own wounds and abrasions.

Small-Pox was widely prevalent and, in many places, exceedingly virulent. An unfortunate concomitant of this state of affairs was that, in consequence of the action of the enemy at sea, consignments of Lymph were often irregular in their arrival; it frequently happened that consignments failed to arrive when they could have been used to the greatest advantage; and sometimes there was acute shortage of supply. In association with this, it must not be forgotten that the communities, amid' which arm to arm vaccinations may be performed safely, are strictly limited.

Vaccination.

	1916.	1917.
Total number vaccinated	9,314	9,147
Total number successful	5,757	4,365

These figures are fallacious; for, although, on paper, 1917 seems to suffer by comparison with 1916, it was really a better year, so far as the number of vaccinations performed went. The Senior Sanitary Officer received, on very reliable authority, reports of vaccinations

performed by keen amateurs, which, if put down, would show 1917 to be ahead of 1916, alike in the total number vaccinated and in the total number successful. Again, all the "modified" and "imperfect" vaccinations are classified as failures; many of the vaccinated go away immediately after the operation and are never seen thereafter; and, although many of them must be successful—on the common ground of averages—they are all written down "failures."

It is hoped that, under the Vaccination Ordinance, a fair number of keen amateurs may eventually be appointed Public Vaccinators: and, if this hope be realised, the results, both on paper and in reality, will show pronounced improvement.

Chicken-Pox is quite common; but, as it rarely assumes a severe form, it is not often brought to notice and is seldom mentioned.

Venereal Diseases constitute a subject which leaves little or nothing of new to be said. To wipe them off curtly is not to be little their significance; for, in the opinion of the present reporter, they constitute by far the gravest problem of the country, whether regarded from the general medical, or the more restricted sanitary, point of view. Little progress is being, or can be, made in fighting against them under existing conditions. The mortality from small-pox is great; but that from Venereal Diseases is probably greater still, if, as they ought to be, abortions, still-births, infantile mortality and barrenness directly traceable to them be counted as mortality. It is not an uncommon experience to encounter wounds and ulcers—in cases in which no specific history can be made out—which obstinately resist treatment until mercurials and iodides are exhibited; after which, they made uninterrupted progress towards complete healing.

The plague is too general for the Medical Officers, posted to Stations or Districts, to hope to make much impression on it: although, of course, their work in their own Stations and the educative influence which they are able to diffuse around them do a certain amount of good. But the Medical Officers are tied too securely to their own Stations by their statutory duties to be able to chase the venereal diseases so widely disseminated among the indigenous natives.

One is almost afraid to report truly on this subject: some estimable people of the most approved orthodoxy are constantly on the look-out for such charges against our population as the prevalence of these diseases amongst it may substantiate.

Now, to ascribe this misfortune to the religion of the Northern Nigerians is most unjust.

Although nothing which is stated in this report and which has been written in former reports, touching the prevalence of this disease, is exaggerated, it must not be forgotten that their incidence is along the trade routes and in the towns thereon: the rural people are just about as simple and pure in their lives as are the rural people at home. Old-fashioned people in Britain, so recently as the forties of last century, used to speak and write about the venereal diseases as: "The sins and sorrows of great cities." And they might be described truthfully, in this part of Nigeria to-day, in the same terms; in fact, one of the commonest Hausa terms for them may be translated literally: "Sickness of the City."

Here, the venereal diseases are, to all intents and purposes, untreated diseases: and, were these diseases untreated in England, they would be as great a plague there as they are here; nay, a greater plague; for the simple abstemious lives led by our indigenous Natives do not afford them such scope for their ravages as do the highly artificial lives of average Europeans.

The local Medical Staff was originally embodied for the purpose of maintaining the employees of the Government in effective bodily health; and it remains to this day, in great part, a garrison medical staff.

It is true that many people, besides the employees of the Government, receive medical aid from the members of the medical staff: but the great majority of those beneficiaries is composed of African Non-Natives, not indigenous Natives; and the observer cannot but regret that the indigenous producer gets so little, where the Non-Native gets so much. The reason for the indigenous Native getting so little, as compared with the Non-Native, is quite simple: the Non-Native has followed the European into the country, realises the benefits obtainable from him, and neither fears nor scruples to seek them; whilst the typical indigenous Native shuns immediate contact with the white man.

It is futile to suggest that the medical staff can do more than it is doing. It has been pointed out how, for the greater part of their time, the medical officers are inevitably thirled to their Stations or the immediate vicinity thereof: at the best of times, some twenty-two Stations have medical officers posted to them—one to each Station, except three or four of the largest Stations, at each of which there may be two—; but, since the outbreak of war, the available medical service has been much less. Now, remembering that the Northern Provinces of Nigeria have, roughly, twice the population and eight times the area of Scotland, the problem to be faced may be stated concisely thus: how to engineer a successful anti-venereal campaign, on modern lines, with a medical personnel of the dimensions set forth above?

It is to be hoped that, after the war, a considerable number of medical officers may be seconded for duty away from recognised stations: at great indigenous Native centres exclusively. This is absolutely necessary, if solid and enduring progress be aimed at: and it ought to be; for the indigenous races concerned constitute, on the whole, a fine people and a people eminently worth preserving.

Helminthic Diseases.

As stated in former reports, these diseases are exceedingly common and very widely distributed.

Ankylostomiasis, accounts for much anæmia and debility in various parts of the country: particularly in flat, or water-logged, pagan regions, the inhabitants of which do not use Salgas. This invasion, for obvious reasons, is best tackled by effecting general sanitary measures in land-word districts: such measures assumed much more the form of pious aspiration than of achievement, during the year under review.

Bilharzia is prevalent in many regions and is more frequently observed in children than it is in adults. The reason for this, most probably, is not that it is really more prevalent among children; but that it is easier to exclude other diseases producing similar symptoms in the case of children than in that of adults.

Guinea Worm is seldom out of sight; there are few, if any, trade routes from which it is absent; and the traveller, who makes an extensive overland journey without observing its presence in one or more of his carriers, enjoys a rare experience. It is much less frequently observed among the indigenous servants of Europeans than it is among Soldiers, Police or any other class of indigenous Natives: and this simple matter of fact makes it reasonable to believe that the general European practice of safe-guarding the water-supply has a certain educative influence.

Other Helminthic invasions leave nothing new to be said. At most stations and townships, meat for human consumption has had to run the gauntlet with increasing uniformity in recent years.

•One somewhat amusing fact shows that the European is careful of the meat which he consumes and that the Native knows that he is so, to wit: amongst those Europeans who keep fowls, he who makes an uniform practice of destroying utterly the carcass of every fowl reported "died" loses fewer chickens than does he who simply orders the removal of the body of a fowl which has died.

At many stations and settlements beyond the reach of medical officers, certain Europeans assume voluntarily the duties of Meat Inspectors: and it is unquestionable that this activity is productive of much good.

That the preventive measures practised are bearing fruit is evident from the fact that these diseases are less common in established settlements, among the resident population, than they were a few years ago—of course, it will be understood that, in this connection, the term, settlements, means directly administered settlements—and that many of the cases observed therein are imported ones.

(III.)—GENERAL MEASURES.

Clearance of Bush, Undergrowth, etc.

Clearing economy has been described fully in former reports and nothing new can be described hereunder. There can be no doubt that a thoroughly wholesome atmosphere has grown up around this subject: the members of the European community, with few or no exceptions, are thoroughly alive to the necessity for this activity and the requisitions for money and labour for effecting it become more numerous and more clamant annually; many non-medical Europeans specialise in tsetse-flies and the unknown haunts of these insects are steadily becoming less numerous; whilst a case of Trypanosomiasis reported in an European excites a feeling of self-reproach among the community which a case of Enteric Fever would fail to effect in London itself. Adequate funds for clearing purposes will never be available in our time: it cannot be otherwise, unless political economy and the sense of proportion cease to dominate public activity.

Settlements and fixed residences together with their surroundings can always be cleared adequately somehow; but it is beyond possibility to clear all the regions, which travellers are steadily penetrating in growing numbers and with increasing frequency, where clearing is desirable to secure comparative safety. For this reason, an increase in the number of Europeans invaded by the Trypanosoma must be expected; for, as travelling increases and new routes are opened up, exposure to attack is almost certain to keep the lead of preventive clearing.

Again, wholesale clearing everywhere is not wise. Vegetation is closely associated with rain-fall; dense forest—there is too little of it in the Northern Provinces—is a most valuable asset as an inducer of rain-fall; to aim at once at deforesting the Southern Section and afforesting or re-afforesting the Northern Section of our Provinces would be a somewhat muddled policy; and it is probably better policy to effect the total evacuation of certain bush regions than it is to clear them; for the people concerned can be settled elsewhere and the water emerging from the evacuated region can be utilised with advantage away from the haunts of the fly. All the tsetse-flies in Africa, however, will not turn aside the prospector searching for valuable minerals or for rich produce; and, in a country such as this, it behoves the officials of the Government to follow—more often, to anticipate—the prospector, the trader, and the exploiter.

The device of broad cleared roads traversing fly-belts has been alluded to already.

Disposal of Refuse.

The extended provision of incinerators continues: and incombustible refuse is buried regularly. During the rains, where incinerators are either non-existent or insufficient, combustible refuse is buried also. On the whole, refuse is disposed of effectively at most settlements; and the extension of dhubing renders concealment of refuse, imperfectly disposed of, more difficult.

Drainage.

The methods of drainage retain the primitive character previously described. Fortunately, by far the greater part of the country lends itself to effective drainage by the primitive means employed.

Regulation of Buildings.

This is covered by the new Townships Ordinance, under which the plans of all buildings erected within Townships have to receive sanction before the work of erection is proceeded with. This procedure secures the suitability for their purpose of the buildings themselves; it secures the erection of them on sound sanitary lines; and it, with the addition of the procedure under the Public Health Ordinance, safeguards the compound against being unduly covered by buildings and the buildings themselves against overcrowding.

Sanitary Inspections (including Food Inspection) and Prosecutions.

There is little to add to what was written on this subject last year. It is a pleasant duty, however, to have to record here the action of several European firms during the year. Since the outbreak of war, the imports of provisions have decreased progressively and there has been, in consequence, keener competition in the purchase of the imported provisions actually in the country. Despite the temptation to sell, arising from the greatly increased prices obtainable, the firms in question voluntarily condemned large quantities of provisions, which the sanitary officer himself would not have felt justified in condemning; on the simple ground that they—the firms—considered that the provisions (tinned, of course) had been too long in the country.

The Markets receive regular inspection: and these inspections are conducted so frequently as the present attenuation of personnel will permit. Law is not the institution characterised by the greatest rapidity in action, in any country; and by the end of the year, too little time had elapsed since the enactment of the new Ordinances for their influence to be greatly felt. But, now, the Markets will feel the application of the Markets Ordinance, seconded by the Public Health and the Townships Ordinances with increasing effect. During the year, Native Offenders in connection with the Markets were dealt with executive more frequently than judicially: it will be otherwise in future; for there is no fault or default in connection with Markets to which one or more of the Ordinances does not apply.

Every effort is made to restrict the sale of foodstuffs to the recognised markets exclusively; and, now, by law, meat may not be exposed for sale elsewhere than in the market where there is a recognised legally established one; nor may it be sold or exposed for sale except during day-light.

The new legislation is likely to encourage the large responsible and to discourage the small poor butcher: this is all to the good; for the large butcher, having too much to lose in the event of a conviction being secured against him, is not so likely as is the small one to find it worth his while to run the risk of being found out.

At the largest Townships, Kaduna and Lokoja, *e.g.*, there are regular Sanitary Inspectors and complete daily inspections are the rule. The Staff of Sanitary Inspectors is bound to increase steadily with the application of the new legislation.

At all Stations to which Medical Officers are posted, the rule is that the entire area concerned is covered by direct medical inspection, at least, once a week; but, since the outbreak of war, at the large stations at which one man has been taking on the work of two, this has been more an ideal than a practice: however much a man may spread himself out, he cannot, even in war time, divide himself into vulgar fractions.

At other stations, much useful work is effected by non-medical officers acting voluntarily as amateur sanitary officers.

It ought to be added that, when prosecutions for sanitary offences are undertaken by medical or sanitary officers, such offences are not regarded or treated lightly by the Magistrates or by the Judicial Officers concerned. By the new legislation,—penalties are prescribed for all sanitary offences.

Sewage Disposal.

With the exceptions mentioned in former reports, the dry earth system of disposal is universal: and, on the whole, it works well.

Town Planning.

This subject has already been alluded to above in connection with the Townships Ordinance. It is a subject which receives full and patient consideration in the case of every new township or settlement.

During the year under review, the plans of several existing townships were revised; and, where practicable, changes deemed expedient were effected. The full effect of the new legislation will not be apparent until after the war; for there are many materials and appliances which are simply unobtainable at present.

Water Supply.

Water supplies continue to be safe-guarded so far as possible: and in the large indirectly administered areas, constant improvements are being effected in the direction of improving the wells and in seeking new sources of supply where this course of procedure appears desirable.

At most Stations, rations of condensed water are at the disposal of the Europeans. The condensers, however, are generally worked by Non-Europeans; there are no fool-proof condensers in the country; and prudent Europeans, remembering this, have their rations of condensed water boiled.

There is one point touching water-supply which may merit mention here, to wit: the ordinary travelling filter is a delusion and a snare; when it is most needed, the water calling for filtering is so thick that, particularly if the filter be of the pump variety, it cracks the candles; and the traveller frequently finds that it would have been advisable, at the outset of his journey, to have replaced his filter by some other article of practical utility—his transport being strictly limited.

A much better device than the travelling filter takes the form of a large tin funnel and a packet of large-size, chemical laboratory, filter papers. On getting into camp, if the water be dirty, it is passed through a filter paper; the paper is then thrown away; and the water is boiled: the filtration thus effected renders the water inviting, or, at least, tolerable; whilst the boiling makes it safe.

It is sometimes necessary to begin by heating the water, if it be too thick, when cold, to pass through the filter paper readily.

Very few travellers who have given this procedure a trial are likely to return to the travelling filter: the present reporter has advocated this practice and followed it himself for many years; numerous Europeans have adopted it; but this is the first time it has been advocated in a report.

(B).—MEASURES TAKEN TO SPREAD KNOWLEDGE OF HYGIENE AND SANITATION.

Elementary Hygiene continues to hold its place as a stock subject in the curriculum of the Provincial Government Schools.

The Sanitary Officers likewise continue to seize every educative opportunity available in the course of their tours: in addition to which, each has attached to him a well-born Native youth, who has already been through the Schools, as a Pupil Sanitary Inspector.

But the personnel of the Educational is pretty well as greatly attenuated as is that of the Medical Department; and it would be blinking the truth, to disguise the fact that the hands of the clock remain turn back.

This is a source of regret; but the present circumstances do not permit, in its entirety: "Business as usual."

(C).—RECOMMENDATIONS FOR FUTURE WORK.

Overtake arrears: this injunction is the only sound recommendation which can be made with any hope of it being effected.

In addition to the maintenance of routine, the work which calls most for attention in the immediate future comprises the extension of vaccinating activity, making the most of recent legislation of sanitary and allied bearing, watching carefully in view of another visitation of Yellow Fever, which is quite likely to occur, and finding out so much as may be possible about the various diseases which are included in the Hausa terms, "Sa'aura and Mayemna.

M. CAMERON BLAIR,

*Senior Sanitary Officer,
Northern Provinces.*

IV.—METEOROLOGY.

The Rainfall has been somewhat above the average but has varied with the locality; at some places it has been greater than 1916 while at others a decrease has been noted.

V.—HOSPITALS AND DISPENSARIES.

The conditions as to Hospitals and Dispensaries recorded in the previous report, continue. Plans have been prepared for Hospitals at Kaduna for Native and for European patients respectively, which it is hoped will be possible to erect in 1918.

The following Table shows the total number of patients treated at the various Hospitals and Dispensaries:—

	1913.	1914.	1915.	1916.	1917.
Average European Population ...	804	969	897	762	779
Europeans	1,547	1,506	1,137	990	1,504
Natives	26,297	29,533	20,251	24,846	31,707

VI.—SCIENTIFIC.

Medical Officers have had little time during the past year to devote to scientific research on account of the increased general work which has fallen to their lot.

Dr. Johnson has however made investigations in reference to the Parasitology of Wild Animals in the Northern Provinces of Nigeria an account of which is contained in his report attached.

ARTHUR PICKELS,

*Principal Medical Officer,
Northern Provinces.*

1st July, 1918.

TABLE I.

MEDICAL STAFF ON 31st DECEMBER, 1918.

Principal Medical Officer	...	...	Dr. J. A. Pickels
Deputy Principal Medical Officer	...	...	„ B. A. Chartres (Lent to War Office)
Provincial Medical Officer	...	...	„ W. E. A. Gordon-Hall
„ „ „	...	...	„ C. E. S. Watson
Senior Medical Officer	...	...	„ G. R. Twomey
„ „ „	...	...	„ H. G. McKinney
„ „ „	...	...	„ J. Currie (Seconded to Uganda)
„ „ „	...	...	„ H. R. Ellis
Medical Officer	...	...	„ B. Moiser
„ „ „	...	...	„ C. W. McLeay
„ „ „	...	...	„ J. M. W. Pollard
„ „ „	...	...	„ W. A. Trumper (Seconded to East Africa)
„ „ „	...	...	„ H. S. Coghill (Lent by S.P.)
„ „ „	...	...	„ Capt. F. E. Bissel (Lent to War Office)
„ „ „	...	...	„ E. J. Porteous
„ „ „	...	...	„ W. A. Nicholson
„ „ „	...	...	„ J. Lindsay (Lent to War Office)
„ „ „	...	...	„ H. C. Jeffreys
„ „ „	...	...	„ G. Rollason
„ „ „	...	...	„ A. J. M. Crichton (Lent to War Office)
„ „ „	...	...	„ L. W. Davies (Lent to War Office)
„ „ „	...	...	„ B. J. Courtney (Seconded to R.A.M.C.)
„ „ „	...	...	„ W. J. Martyn-Clark (Lent by S.P.—Seconded to East Africa)
„ „ „	...	...	„ B. A. Percival (Lent to Gibraltar)
„ „ „	...	...	„ J. W. Thomson
„ „ „	...	...	„ R. Willen
„ „ „	...	...	„ E. J. Powell (Lent by Sierra Leone—Seconded to East Africa)
„ „ „	...	...	„ W. C. Cobb (Lent to War Office)
„ „ „	...	...	„ W. B. Johnson
„ „ „	...	...	„ R. H. Nolen
„ „ „	...	...	„ P. W. Black (Lent to War Office)
„ „ „	...	...	„ N. A. Dyce Sharp
„ „ „	...	...	„ J. C. C. Hogan
„ „ „	...	...	„ J. N. Benson (Seconded to East Africa)
„ „ „	...	...	„ C. J. H. Pearson (Seconded to East Africa)
„ „ „	...	...	„ B. W. F. Wood
„ „ „	...	...	„ H. North (Lent to War Office)
„ „ „	...	...	„ W. E. S. Digby
„ „ „	...	...	„ J. T. Watt (Seconded to Somaliland)

NON-COMMISSIONED OFFICERS S.A.M.C. ON 31ST DECEMBER, 1917.

Staff Sergeant	...	...	...	...	F. H. Plaum
Sergeant	...	...	...	...	I. Meason (Serving in East Africa)
"	...	...	...	...	C. W. O'Bergin (Serving in East Africa)
"	...	...	...	...	I. B. Kelliher (Serving in East Africa)
"	...	...	...	...	H. W. J. Turnbull (Serving in East Africa)
"	...	...	...	...	B. A. Baigent (Serving in East Africa)
"	...	...	...	...	A. Pretious (Serving in East Africa)
"	...	...	...	...	T. S. C. Rogers "
"	...	...	...	...	H. Blair "
"	...	...	...	...	T. H. Smitherman "

NURSING STAFF ON 31ST DECEMBER, 1917.

Male Nurse	...	...	...	J. W. Vincent
Senior Nurse	...	...	...	Sister E. F. Dunne
Nurse	...	...	...	" G. Coupe
"	...	...	...	" B. M. Renwick
"	...	...	...	" M. Munro
"	...	...	...	" M. E. Tate
"	...	...	...	" E. B. Mellis
"	...	...	...	" D. C. A. Rolfs
"	...	...	...	" M. I. Rhind

PRINCIPAL MEMBERS OF SUBORDINATE STAFF.

First Class Clerk	...	...	...	J. F. Eshon
"	"	"	...	T. R. Mullen
"	"	"	...	E. A. Williams
"	"	"	...	E. P. Benin
Second Class Clerk	...	...	...	N. O. Dixon
"	"	"	...	J. H. Agusiobo
"	"	"	...	J. E. Ogodasi

DISPENSING STAFF.

First Class Dispenser	J. J. Nicol
”	”	”	S. J. Coker
”	”	”	T. J. Watson
Second Class Dispenser	...	I. N. Anthony	
”	”	D. A. Olubi	
”	”	O. M. Fadipe	
”	”	F. A. John	
”	”	M. Marchie	
”	”	J. N. Allen	
”	”	L. D. Emanuel	
”	”	W. B. G. Lawson	

SANITARY STAFF ON 31ST DECEMBER, 1917.

Senior Sanitary Officer	...	Dr. M. Cameron Blair
Sanitary Officer	...	" W. J. D. Inness

PRINCIPAL MEMBERS OF SUBORDINATE STAFF.

Second Class Clerk	...	J. B. Woode
Inspector of Nuisance	...	G. B. Joseph
"	"	Marku
"	"	O. B. Langley

TABLE V.
METEOROLOGICAL RETURNS FOR THE YEAR 1917.
 · · STATION—Ilorin.

				Lat. 8 -30' 26·77" N.		Long. 4—34' 53·9" E.			
				Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
								%	
January	...	...	...	99	50	94·4	69·6	73	...
February	...	...	...	103	66	95·2	70·8	76	3·00
March	...	...	...	99	68	96·8	72·6	66	2·20
April	...	...	...	105	67	95·1	71·6	69	4·52
May	...	...	...	96	66	91·5	70·7	72	4·39
June	...	...	...	91	65	87·5	69·8	72	8·50
July	...	...	...	90	67	85·5	71·0	82	10·96
August	...	...	...	88	67	84·0	71·8	82	15·98
September	...	...	...	88	68	85·1	69·1	86	8·02
October	...	...	...	93	65	89·6	68·4	86	4·02
November	...	...	...	93	59	89·6	69·4	79	1·51
December	...	...	...	95	54	91·0	67·9	74	1·78
Means	...	...	...	105	54	90·4	70·2	76%	64·88

STATION—KADUNA CAPITAL.

				Lat. 10—32' 05" N.	Long. 7—25' E.				
							%		
January	98	46	93·8	62·9	50	...
February	100	61	95·5	66·3	48	0·14
March	101	62	98·0	67·6	41	0·07
April	101	64	95·0	72·2	59	2·22
May	97	62	89·1	70·0	67	6·66
June	90	63	85·2	67·1	78	5·27
July	87	63	82·4	66·3	88	10·58
August	88	63	81·0	67·2	91	14·22
September	87	63	82·2	66·1	90	12·80
October	92	58	88·5	63·6	75	...
November	93	55	89·3	62·2	57	0·08
December	94	54	89·1	58·4	41	...
Means	101	46	89·0	65·8	65%	52·04

STATION—KANO.

			Lat. 12—00' 12" N.	Long. 8—32' 42·29" E. .				
							%	
January	...	...	103	49	96·0	55·5	32	...
February	...	...	104	53	98·9	59·8	28	...
March	...	...	110	58	106·0	68·9	30	...
April	...	...	108	45	104·6	67·1	33	0·25
May	...	...	106	65	100·2	72·6	48	3·90
June	...	...	100	67	85·7	72·8	62	2·87
July	...	...	98	66	90·0	70·3	69	9·31
August	...	...	93	65	87·8	69·5	70	11·97
September	...	...	98	62	89·9	68·9	77	5·64
October	...	...	100	54	95·5	60·7	38	...
November	...	...	98	49	93·0	60·4	43	...
December	...	...	96	50	88·2	54·1	34	...
Means ...			110	45	94·6	65·0	47%	33·94

METEOROLOGICAL RETURNS FOR THE YEAR

1917—continued.

STATION—LOKOJA.

				Lat. 7—48' N.		Long. 6—45' E.			
				Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
								%	
January	...	...	...	117	58	93·5	70·0	73	0·27
February	...	...	...	98	70	94·8	74·6	72	...
March	...	...	...	101	72	97·5	75·8	66	...
April	...	...	...	99	68	94·3	74·0	68	6·40
May	...	...	...	94	64	89·0	73·3	76	6·14
June	...	...	...	91	67	87·7	72·5	76	8·49
July	...	...	...	94	64	89·0	73·3	76	6·14
August	...	...	...	89	70	85·3	72·0	84	10·96
September	...	...	...	90	68	86·0	71·9	76	6·31
October	...	...	...	97	68	90·7	71·0	71	1·66
November	...	...	...	97	61	91·0	70·1	73	1·24
December	...	...	...	97	61	91·8	67·4	72	...
Means	...	...	...	117	58	90·8	72·2	73%	47·61

STATION—MAIDUGURI.

				Lat. 11—47' N.		Long. 13—11" E.			
								%	
January	...	..		104	51	97·9	58·1	37	...
February	...	...		107	56	99·7	62·0	38	...
March	...	...	...	113	57	104·0	66·9	85	...
April	...	...	...	112	63	108·0	69·3	35	0·73
May	...	...	...	111	68	104·0	75·3	45	3·18
June	...	...	...	108	71	101·5	74·8	59	2·74
July	...	...	...	104	67	89·6	73·3	69	6·09
August	...	...	...	98	68	92·1	72·0	73	4·07
September	...	...	...	100	67	82·6	71·6	71	5·06
October	...	...	...	105	62	100·6	67·3	39	...
November	...	...	...	106	55	100·0	65·1	40	...
December	...	...	...	102	56	93·9	59·1	40	...
Means				113	51	98·6	67·9	52%	21·87

STATION—NARAGUTA.

				Lat. 9—56' N.		Long. 8—32' 50" E.			
								%	
January	...	...	...	88	54	84·0	60·4	34	...
February	..	...	...	87	59	83·0	63·5	31	0·05
March	...	...	...	95	60	87·9	66·2	44	0·66
April	...	...	...	92	64	84·4	66·5	48	5·21
May	...	...	...	99	62	80·2	65·1	61	7·02
June	...	...	...	86	60	78·5	64·5	66	12·13
July	...	...	...	85	61	78·0	62·8	70	16·99
August	...	...	...	82	55	83·9	62·4	76	17·01
September	...	...	...	82	60	75·6	62·6	76	15·82
October	...	...	...	85	56	83·5	61·5	40	0·05
November	...	...	...	86	56	82·3	62·2	45	0·77
December	...	...	...	86	55	81·2	50·8	32	...
Means ...				95	54	81·8	63·2	51%	75·71

METEOROLOGICAL RETURNS FOR THE YEAR
1917—continued.

STATION—SOKOTO.

				Lat. 13—02' 10" N.		Long. 5—14' 46·9" E.			
				Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
								%	
January	...	...	...	106	55	99·7	78·8	27	...
February	...	...	...	107	57	104·7	83·4	30	...
March	...	...	...	114	55	109·7	85·4	13	...
April	...	...	...	115	53	110·4	88·2	29	...
May	...	...	...	110	70	101·3	88·6	48	4·23
June	...	...	...	104	72	99·9	88·2	54	0·39
July	...	...	...	104	67	93·6	83·1	64	5·32
August	...	...	...	96	68	90·3	81·2	71	4·97
September	...	...	...	99	60	92·6	82·4	69	3·87
October	...	...	...	104	62	100·8	84·3	45	...
November	...	...	...	105	61	99·4	84·1	38	...
December	...	...	...	102	58	96·1	70·8	31	...
Means	...	...	...	115	53	99·8	68·3	42%	18·78

STATION—YOLA.

				Lat. 9—12' 28·9" N.	Long. 12—29' 30" E.				
								%	
January	...	...	...	100	62	99·8	68·9	53	...
February	...	...	...	103	69	99·2	75·1	43	...
March	...	...	...	106	71	101·9	75·3	45	0·22
April	...	...	...	...	...	...	...	...	...
May	...	...	...	...	...	...	...	...	...
June	...	...	...	100	64	92·1	72·8	70	3·85
July	...	...	...	96	63	88·3	72·1	79	4·22
August	...	...	...	94	67	86·6	71·7	66	11·85
September	...	...	...	94	67	87·0	70·6	80	9·73
October	...	...	...	100	68	85·4	72·7	65	0·52
November	...	...	...	100	66	96·2	70·5	59	0·60
December	...	...	...	101	60	96·1	66·8	39	...
Means	...	...	...	106	60	94·2	71·4	60%	30·79

* No records kept.

STATION—ZARIA.

				Lat. 11- 06' N.	Long. 7—30' E.				
								%	
January	..	...		98	50	92·1	60	30	...
February	...	...		07	53	93·4	62	31	0·05
March	...	...		99	56	94·3	71·3	33	0·02
April	...	...		100	58	96·3	77·4	52	0·93
May	...	...		98	66	91·5	77	60	3·43
June	...	...		93	63	84·3	66·1	87	5·46
July	...	...		87	63	75·6	69·9	77	8·65
August	...	...		88	60	83·3	70	77	14·54
September	...	...		88	63	83·7	70	75	7·58
October	...	...		91	50	88·1	65·5	54	...
November	...	...		98	53	89·5	61·6	46	...
December	...	...		99	49	87·3	62·1	38	...
Means	...	...		100	49	88·2	63·3	55%	40·66

METEOROLOGICAL RETURNS FOR THE YEAR
1917—*continued*.

STATION—ZUNGERU.

				Lat. 9° 18' 32.4" N.		Long. 6° 9' 42.26" E.			
				Absolute shade maximum.	Absolute shade minimum.	Average maximum.	Average minimum.	Relative humidity.	Rainfall in inches.
								%	
January	...	...	...	100	59	96.2	68.5	62	...
February	...	...	...	101	66	96.4	71.0	64	0.80
March	...	...	...	104	64	103.5	71.8	68	...
April	...	...	...	104	70	99.5	76.3	73	1.64
May	...	...	...	102	68	94.9	74.7	84	3.93
June	...	...	...	96	68	91.2	72.6	82	2.57
July	...	...	...	93	67	88.1	71.3	83	6.84
August	...	...	...	91	69	86.7	72.4	87	12.81
September	...	...	...	92	68	86.3	70.7	85	13.10
October	...	...	...	97	67	92.6	69.9	80	0.87
November	...	...	...	86	61	93.3	68.8	75	0.66
December	...	...	...	101	56	95.5	65.6	44	...
Means	...	...	...	104	59	93.7	71.1	73%	43.22

METEOROLOGY.

TABLE SHOWING RAINFALL IN INCHES.

	YEAR.												AVERAGE TO 1916.	RAINFALL 1917.
	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.*	1914.	1915.	1916.	
Abinsi	58.77	66.85	56.44	...	47.81	49.78	...	...	53.49	...
Ankpa	47.88	43.23	38.86	...	35.83	33.89	19.57	...	10.84	66.98
Bauchi	42.24	...	46.46	55.77	47.98	18.79	43.51	39.50	45.16	...	50.23	...
Baro	27.70	25.10	46.14	20.32	33.37	32.33	47.51	41.90	...
Birnin-Kebbi	21.28	16.87	30.69	12.59	5.76	21.77	14.46	24.77	...
Geidam	22.39	53.30	49.63	10.46	16.10	43.42	19.30	...	15.52	...
Ibi	23.49	...	...	53.30	49.63	36.38	38.85	43.83	23.75	39.47	40.33	43.18
Ilorin	...	47.02	49.00	54.74	55.46	65.18	51.14	52.58	...	29.56	42.83	43.37	49.70	64.88
Jebba	49.03	26.18	...	29.20	19.05	30.93	53.22	37.90	...
Kano	...	36.69	38.12	27.55	34.86	...	...	40.00	...	...	19.06	32.33	32.58	33.94
Kaduna Capital...	52.04
Kaduna Junction	41.67	61.90	51.39	...
Katagum	23.70	23.03	18.21	19.96	20.50	13.81	9.54	...	21.15	18.18
Kontagora	...	46.28	58.40	37.28	51.15	60.67	53.01	54.09	32.83	36.27	6.51	...	43.65	...
Lokoja	41.72	49.64	51.83	36.68	44.12	65.14	45.59	41.57	46.74	34.76	42.81	48.15	61.13	47.61
Maiduguri	23.30	31.89	19.53	30.00	18.38	13.98	11.49	25.32	33.04	21.87
Minna	53.62	60.08	61.18
Nafada	37.27	33.24	30.32	22.01	16.58	...	...	37.17	25.27
Naraguta...	57.84	47.33	51.37	22.28	...	28.41	75.71
Ofa	40.82	30.58	61.91	72.16	52.93
Sokoto	32.14	33.32	...	19.86	20.44	29.72	23.11	28.70	19.16	16.38	24.91	28.37	24.46	18.78
Womba, etc.	19.11	...	49.02	44.40	40.45	53.95	58.94	49.40	...	25.05	80.84
Yola	33.77	42.76	34.60	27.55	53.77	44.26	38.67	42.22	38.93	29.93	27.83	26.70	36.99	30.79
Zaria	...	51.27	61.05	29.80	45.48	55.88	53.80	43.35	43.13	33.01	35.64	46.95	45.76	40.66
Zungeru	51.10	41.31	60.39	37.16	48.78	58.89	53.44	42.90	29.93	35.17	33.46	54.61	39.06	43.22

TABLE VI.

RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.		
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.		
		Admis- sions.	Deaths.			Cases treated.	Deaths.	
INFECTIVE DISEASES.								
Beri-Beri	
Cerebro-Spinal Fever	
Chicken Pox	
Cholera	
Dengue...	
Diphtheria	1	...	
DYSENTERY:—								
(a) Amœbic...	10	...	10	...	17	2	
(b) Bacillary	
(c) Type not determined... ..	1	...	...	1	...	1	...
Endocarditis-infective	
Enteric...	3	...	
Erysipelas	1	...	
Gonorrhœa	16	...	
Influenza	1	13	...	
Kala-Azar	
LEPROSY:—								
(a) Nodular	
(b) Anaesthetic	
MALARIA:—								
(a) Tertian	2	53	...	55	...	16	...	
(b) Quartan	2	...	
(c) Aestivo-Autumnal	26	...	26	5	246	2	
(d) Chronic	2	...	
(e) Type not determined	14	1	
Blackwater Fever	1	7	...	8	...	11	4	
Measles	1	...	1	...	1	...	
Papataci Fever	
Plague	
Pneumonia	1	1	1	...	2	...	
Pyrexia of uncertain origin	2	...	2	...	...	...
Rabies	3	...	
Relapsing Fever	
Rheumatic Fever	7	...	7	...	1	...	
Septicaemia	
Small-Pox	
Syphilis (a) Primary	1	...	
(b) Secondary	2	...	2	...	2	...	
(c) Inherited	
Tetanus	
Trypanosomiasis (Sleeping Sickness)	1	...	1	...	1	...	
Tuberculosis	2	...	
Undulant Fever	
Whooping Cough	
Yaws	
Yellow Fever	9	4	
Other Diseases	1	...	
INTOXICATIONS:—								
Alcoholism	1	...	1	...	1	...	
Morphinism	
Other Intoxications	
GENERAL DISEASES:—								
Anæmia	10	...	10	...	37	...	
Anæmia-Pernicious	
Diabetes	
Exophthalmic goitre	

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.	
		Admis- sions.	Deaths.			Cases treated.	Deaths.
General Diseases— <i>continued</i> .							
Gout	3	...
Leucocythæmia
Lymphadenoma
Myxœdema
Purpura
Rickets
Scurvy
Other Diseases	7	...	7	...	49	...
LOCAL DISEASES.							
DISEASES OF THE NERVOUS SYSTEM:—							
Sub-section 1.—Diseases of the Nerves:—							
Neuritis	1	1	1	...	3	...
Meningitis
Myelitis
Hydrocephalus
Encephalitis
Abscess of brain
Congestion of brain
Other Diseases	4	...	4	...	8	...
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—							
Apoplexy
Paralysis	1	...
Chorea
Epilepsy	25	...
Neuralgia
Hysteria
Other Diseases	2	...	2	...	13	...
Sub-section 3.—Mental Diseases:—							
Idiocy
Mania
Melancholia
Dementia	1	...	1	...	...	...
Delusional Insanity	1	...
Other Diseases	2	...	2	...	...	...
DISEASES OF THE EYE:—							
Conjunctivitis	9	...
Keratitis	2	...
Ulceration of cornea
Iritis	1	...
Optic neuritis
Cataract
Other Diseases	1	...	1	...	6	...
DISEASES OF THE EAR:—							
Inflammation	5	...
Other Diseases	14	...
DISEASES OF THE NOSE:—							
Inflammation	3	...
Other Diseases
DISEASES OF THE CIRCULATORY SYSTEM:—							
Pericarditis
Endocarditis

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.	
		Admis- sions.	Deaths.			Cases treated.	Deaths.
LOCAL DISEASES— <i>continued</i> .							
Valvular Disease :—							
(1) Mitral
(2) Aortic	3	...
(3) Tricuspid
(4) Pulmonary
Arterial sclerosis
Aneurism
Other Diseases	5	...	5	...	8	...
DISEASES OF THE RESPIRATORY SYSTEM :—							
Laryngitis	2	...
Bronchitis	3	...	3	...	22	...
Broncho-pneumonia	3	...
Abscess of Lung	1	...
Gangrene of Lung
Emphysema
Pleurisy	8	...
Empyema
Other Diseases	2	...	2	...	23	...
DISEASES OF THE DIGESTIVE SYSTEM :—							
Stomatitis	10	...
Caries of teeth	1	33	...
Pyorrhœa alveolaris	2	...	2	...	9	...
Glossitis	2	...
Sore throat	9	...
Inflammation of tonsils	3	...	3	...	17	...
Gastritis	14	...	14	...	76	...
Ulceration of stomach
Hæmatemesis	1	...	1	...	...	...
Dilatation of stomach
Stricture of stomach
Dyspepsia	2	...	2	...	50	...
Enteritis	4	...	4	...	4	...
Appendicitis	2	...	2	...	1	...
Colitis	5	...	5	...	22	...
Ulceration of intestines	1	...
Sprue	3	...
Hernia	5	...	5	...	54	...
Diarrhœa	8	...
Constipation	1	...	1	...	10	...
Colic	1	...	1	...	9	...
Hæmorrhoids
Pancreatitis
Hepatitis—Acute	1	1	1	...	7	...
Abscess	5	...	5	2	...	...
Cirrhosis	1	...	1	...	1	...
Jaundice
Peritonitis
Ascites
Other Diseases	5	...	5	...	8	...
DISEASES OF THE LYMPHATIC SYSTEM :—							
Splenitis
Inflammation of lymphatic gland	8	...
Suppuration of lymphatic gland...	1	3	...
Lymphangitis	2	...
Elephantiasis
Other Diseases	6	...	6	...	...	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.						OUT-PATIENTS.	
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.		
		Admis- sions.	Deaths.			Cases treated.	Deaths.	
LOCAL DISEASES — <i>continued</i> .								
DISEASES OF THE URINARY SYSTEM:—								
Acute nephritis	1	1	1	...	1	...
Bright's Disease
Pyelitis	1	...
Calculus	1	...
Renal colic
Cystitis	5	...	5	...	6	...
Vesical calculus	1	...
Suppression	1	...
Hæmaturia	1	...	1	...	...	...
Chyluria
Other Diseases	1	...
DISEASES OF THE GENERATIVE SYSTEM:—								
Male Organs:—								
Urethritis	11	...
Gleet
Stricture	1	...	1	...	1	...
Prostatitis	1	...
Soft chancre
Condyloma
Inflammation of scrotum
Hydrocele	1	...	1	...	...	...
Orchitis	1	...
Epididymitis	2	...	2	...	2	...
Abscess of testicle
Other Diseases	3	...	3	...	4	...
Female Organs:—								
Ovaritis	1	...	1	...	...	...
Ovarian cyst
Endometritis	1	...	1	...	...	...
Displacement of uterus
Vaginitis
Amenorrhœa
Dysmenorrhœa
Menorrhagia	1	...
Leucorrhœa
Other Diseases	1	...
AFFECTIONS CONNECTED WITH PREGNANCY:—								
Abortion	1	...
Other Affections
AFFECTIONS CONNECTED WITH PARTURITION:—								
Delayed Labour
Retained placenta
Premature Birth
Other Affections	1	...
AFFECTIONS CONSEQUENT ON PARTURITION:—								
Post-partum hæmorrhage
Puerperal septicæmia
Mastitis
Abscess of breast
Other Affections
DISEASES OF ORGANS OF LOCOMOTION:—								
Osteitis
Arthritis	1	...	1	...	3	...

TABLE VI.—RETURN OF DISEASES AND DEATHS (EUROPEAN)
FOR THE YEAR 1917—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.		
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	TOTAL.		
		Admis- sions.	Deaths.			Cases treated.	Deaths.	
LOCAL DISEASES— <i>continued.</i>								
Diseases of Organs of Locomotion— <i>continued.</i>								
Spondylitis	
Bursitis	1	...	
Myalgia	2	...	2	...	21	...	
Other Diseases	5	...	
DISEASES OF CONNECTIVE TISSUE:—								
Cellulitis	5	...	5	...	6	...	
Abscess	2	...	2	...	14	...	
Other Diseases	3	...	
DISEASES OF THE SKIN:—								
Ulcer	2	...	2	...	17	...	
Urticaria	
Eczema	1	6	...	
Boil	2	...	2	1	26	...	
Carbuncle	1	...	
Herpes	1	...	1	...	3	...	
Psoriasis	1	...	1	...	1	...	
Oriental sore	
Tinea	4	...	
Scabies	1	...	
Acne	1	...	
Prickly heat	3	...	
Other Diseases	5	...	5	...	19	...	
INJURIES:—								
General	7	...	7	...	18	...	
Local	9	...	9	...	70	...	
TUMOURS:—								
Benign	
Malignant	
Malformations	
POISONS:—								
Vegetable	
Animal	4	...	
Other Poisons	6	...	
PARASITES.								
ANIMAL PARASITES:—								
Protozoa	
Trematoda (Flukes)	2	...	2	...	1	...	
Cestoda:—								
Tænia solium	
Tænia saginata	1	...	
Other Cestodes	4	...	
Nematoda:—								
Ascaris	
Tricocephalus dispar	
Trichina	
Dracunculus	
Filaria	
Strongylus	
Ankylostomum	
Oxyuris	1	...	
Other Nematodes	
Insecta:—								
Insects producing myiasis	
Dematophilus penetrans	1	...	
Other Insects	
Total	4	262	4	266	12	1,241	14	

TABLE VII.

RETURN OF DISEASES AND DEATHS (NATIVE)
FOR THE YEAR 1917.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
INFECTIVE DISEASES :—						
Beri-Beri ... ..	...	...	...	...	...	...
Cerebro-Spinal Fever	1	2	1	3	...	...
Chicken Pox ... ..	...	13	...	13	...	14
Cholera ... ..	...	1	...	1	...	2
Dengue ... ..	...	1	...	1	...	...
Diphtheria ... ..	...	...	...	...	...	...
Dysentery :—						
(a) Amœbic	4	149	12	153	8	107
(b) Bacillary ... ..	...	32	...	32	...	6
(c) Type not determined	3	44	1	47	...	22
Endocarditis-Infective ... ..	...	...	...	...	...	...
Enteric ... ..	...	12	...	12	...	...
Erysipelas ... ..	...	1	...	1	...	...
Gonorrhœa	28	1,013	...	1,041	35	424
Influenza ... ..	...	1	...	1	...	27
Kala-Azar ... ..	...	...	...	...	...	...
Leprosy :—						
(a) Nodular	538	107	62	645	534	5
(b) Anæsthetic ... ..	...	1	...	1	...	10
Malaria :—						
(a) Tertian	1	199	...	200	7	23
(b) Quartan ... ..	...	2	...	2	...	113
(c) Aestivo-autumnal	9	538	8	547	7	1,292
(d) Chronic ... ..	...	2	...	2	...	3
(e) Type not determined ... ..	...	14	...	14	...	61
Blackwater Fever ... ..	...	1	...	1	...	1
Measles	1	8	...	9	...	13
Papataci Fever ... ..	...	...	...	...	...	...
Plague ... ..	...	...	...	...	...	...
Pneumonia	6	122	26	128	10	14
Pyrexia of uncertain origin ... ..	...	54	1	54	...	...
Rabies ... ..	...	1	...	1	...	1
Relapsing Fever ... ..	...	...	...	...	...	...
Rheumatic Fever ... ..	...	9	1	9	1	19
Septicæmia ... ..	...	9	5	9	2	...
Small-Pox ... ..	...	66	16	66	15	5
Syphilis (a) Primary	2	170	1	172	14	134
(b) Secondary	38	238	4	276	27	224
(c) Inherited ... ..	...	...	...	...	...	11
Tetanus ... ..	...	2	2	2	...	...
Trypanosomiasis (Sleeping Sickness) ... ..	...	3	1	3	2	4
Tuberculosis	1	14	4	15	1	12
Undulant Fever ... ..	...	...	...	...	...	...
Whooping Cough ... ..	...	...	...	...	...	2
Yaws	1	8	...	9	1	11
Yellow Fever ... ..	...	...	...	...	...	...
Other Diseases ... ..	...	28	1	28	...	17
INTOXICATIONS :—						
Alcoholism ... ..	...	...	...	...	...	...
Morphinism ... ..	...	...	...	...	...	...
Other Intoxications ... ..	...	...	...	...	...	...
GENERAL DISEASES :—						
Anæmia	36	3	36	2	...	100
Anæmia-Pernicious ... ..	...	...	...	...	...	...
Diabetes ... ..	...	...	...	...	...	...
Exophthalmic Goitre ... ..	...	...	...	...	...	...

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
GENERAL DISEASES— <i>continued</i> .						
Gout	1
Leucocythæmia
Lymphadenoma
Myxœdema
Purpura
Rickets
Scurvy
Other Diseases	4	39	1	43	1	527
LOCAL DISEASES.						
DISEASES OF THE NERVOUS SYSTEM:—						
Sub-section 1.—Diseases of the Nerves:—						
Neuritis	2	...	2	...	21
Meningitis	3	3	3	...	...
Myelitis...
Hydrocephalus
Encephalitis
Abscess of brain
Congestion of brain
Other Diseases	1	1	1	...	1
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature:—						
Apoplexy
Paralysis	1	4	4	5	1	2
Chorea
Epilepsy	4	...	4	...	26
Neuralgia	13	...	13	...	187
Hysteria	1	...	1	...	3
Other Diseases	1	14	...	15	...	59
Sub-section 3.—Mental Diseases:—						
Idiocy
Mania	1	1	1	...	...
Melancholia	1	...	1	...	1
Dementia	3	1	3	...	...
Delusional Insanity
Other Diseases	1	...	1	...	91
DISEASES OF THE EYE:—						
Conjunctivitis	2	84	...	86	2	789
Keratitis...	2	...	2	...	12
Ulceration of cornea	3	...	3	...	14
Iritis	2	...	2	...	6
Optic neuritis
Cataract	15
Other Diseases	9	...	9	3	41
DISEASES OF THE EAR:—						
Inflammation	12	...	12	...	164
Other Diseases	3	1	3	...	74
DISEASES OF THE NOSE:—						
Inflammation	1	...	1	...	2
Other Diseases	1	...	1	...	6
DISEASES OF THE CIRCULATORY SYSTEM:—						
Pericarditis	1	1	1	...	1
Endocarditis	3	2	3	...	1

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
LOCAL DISEASES— <i>continued.</i>						
Valvular Disease :—						
(1) Mitral	1	12	6	13	3	19
(2) Aortic ... ..	...	2	...	2	...	1
(3) Tricuspid ... ..	...	...	...	...	...	...
(3) Pulmonary ... ..	...	...	...	...	...	1
Arterial sclerosis ... ..	...	1	...	1	...	1
Aneurism ... ..	...	2	1	2	...	...
Other Diseases	1	14	1	15	...	11
DISEASES OF THE RESPIRATORY SYSTEM :—						
Laryngitis ... ..	...	11	...	11	...	58
Bronchitis	7	289	2	296	18	1,793
Broncho-pneumonia	1	34	10	35	4	10
Abscess of Lung ... ..	...	...	...	...	...	...
Gangrene of Lung ... ..	...	...	...	...	...	...
Emphysema ... ..	...	1	...	1	...	...
Pleurisy	2	44	2	46	4	48
Empyema ... ..	...	1	...	1	...	...
Other Diseases ... ..	...	20	3	20	...	483
DISEASES OF THE DIGESTIVE SYSTEM :—						
Stomatitis ... ..	...	2	...	2	...	58
Caries of teeth ... ..	...	4	...	4	...	193
Pyorrhœa alveolaris ... ..	...	2	...	2	...	38
Glossitis ... ..	...	3	...	3	...	14
Sore throat ... ..	...	6	...	6	...	54
Inflammation of Tonsils ... ..	...	19	...	19	...	57
Gastritis	1	15	1	16	...	264
Ulceration of Stomach ... ..	...	...	...	...	...	...
Hæmatemesis ... ..	...	...	...	...	...	2
Dilatation of stomach ... ..	...	...	...	...	...	...
Stricture of stomach ... ..	...	4	...	4	...	30
Dyspepsia ... ..	...	12	...	12	...	261
Enteritis ... ..	...	16	10	16	...	38
Appendicitis ... ..	...	...	...	...	...	2
Colitis	1	5	...	6	...	12
Ulceration of intestines ... ..	...	...	...	...	...	...
Sprue ... ..	...	...	...	...	...	...
Hernia ... ..	...	33	2	33	2	24
Diarrhœa	1	229	...	230	1	601
Constipation ... ..	...	39	...	39	...	2,272
Colic	1	23	1	24	...	258
Hæmorrhoids ... ..	...	10	...	10	...	36
Pancreatitis ... ..	...	...	...	...	...	1
Hepatitis—Acute ... ..	...	5	1	5	...	7
Abscess ... ..	...	3	...	3	...	...
Cirrhosis ... ..	...	5	2	5	1	1
Jaundice ... ..	...	23	2	23	...	16
Peritonitis ... ..	...	4	4	4	...	1
Ascites ... ..	...	2	2	2	...	7
Other Diseases ... ..	...	18	4	18	2	27
DISEASES OF THE LYMPHATIC SYSTEM :—						
Splenitis	1	2	...	3	1	16
Inflammation of lymphatic gland	3	88	...	91	5	132
Suppuration of lymphatic gland	1	31	1	32	2	31
Lymphangitis ... ..	...	3	...	3	...	15
Elephantiasis ... ..	...	2	...	2	...	3
Other Diseases ... ..	...	3	...	3	...	4

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
DISEASES OF THE URINARY SYSTEM :—						
Acute nephritis	6	2	6	...	3
Bright's Disease	3	1	3	...	5
Pyelitis
Calculus
Renal colic	4	1	4	...	2
Cystitis	1	16	2	17	...	18
Vesical calculus	1	1	...	2	...	2
Suppression	1	...	1	...	...
Hæmaturia	4	...	4	...	5
Chyluria
Other Diseases	2	2	2	...	3
DISEASES OF THE GENERATIVE SYSTEM : —						
Male Organs :—						
Urethritis	1	...	1	...	12
Gleet	10	...	10	...	57
Stricture...	10	2	10	...	12
Prostatitis	2	...	2	...	1
Soft chancre	3	73	...	76	4	51
Condyloma	7	...	7	...	2
Inflammation of scrotum	2	...	2	1	3
Hydrocele	1	31	...	32	2	25
Orchitis	29	...	29	2	38
Epididymitis	1	8	...	9	...	16
Abscess of testicle	2	...	2	...	...
Other Diseases	1	25	...	26	...	23
Female Organs :—						
Ovaritis	3
Ovarian cyst	1	...	1	1	1
Endometritis	2	...	2	...	19
Displacement of uterus	1	...	1	...	2
Vaginitis...	3
Amenorrhœa	8
Dysmenorrhœa	7
Menorrhagia	4
Leucorrhœa	1	...	...	1	...	1
Other Diseases	2	...	2	1	8
AFFECTIONS CONNECTED WITH PREGNANCY :—						
Abortion...	1	...	1	...	5
Other Affections	1	...	1	...	...
AFFECTIONS CONNECTED WITH PARTURITION :—						
Delayed Labour	2	1	2	...	...
Retained placenta	2
Premature Birth
Other Affections	1	...	1	...	...
AFFECTIONS CONSEQUENT ON PARTURITION :—						
Post-partum hæmorrhage	1
Puerperal septicæmia	2
Mastitis	3
Abscess of breast	2
Other Affections
DISEASES OF ORGANS OF LOCOMOTION :—						
Osteitis	6	1	6	...	11
Arthritis... ..	3	30	1	33	...	54

TABLE VII.—RETURN OF DISEASES AND DEATHS (NATIVE) FOR THE
YEAR 1917—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.
	Remaining in Hospital at end of 1916.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1917.	Total cases treated.
		Admis- sions.	Deaths.			
LOCAL DISEASES— <i>continued</i> .						
DISEASES OF ORGAN OF LOCO- MOTION— <i>continued</i> .						
Spondylitis ... ..	...	...	...	...	...	2
Bursitis ... ..	...	3	...	3	...	12
Myalgia... ..	2	135	...	137	6	1,163
Other Diseases... ..	1	76	...	77	3	222
DISEASES OF CONNECTIVE TISSUE:—						
Cellulitis... ..	...	63	...	63	2	181
Abscess	3	222	3	225	11	494
Other Diseases... ..	...	3	...	3	...	5
DISEASES OF THE SKIN:—						
Ulcer	29	243	1	272	14	2,031
Urticaria ... ..	...	4	...	4	...	11
Eczema	1	7	...	8	...	91
Boil	3	46	...	49	1	317
Carbuncle ... ..	...	1	...	1	...	3
Herpes ... ..	...	6	...	6	...	22
Psoriasis... ..	1	...	...	1	...	3
Oriental sore ... ..	...	...	...	...	...	2
Tinea	2	12	...	14	...	67
Scabies ... ..	...	8	...	8	...	78
Acne ... ..	...	1	...	1	...	2
Prickly heat ... ..	...	...	...	...	...	4
Other Diseases... ..	1	42	...	43	8	331
INJURIES:—						
General	2	68	5	70	3	544
Local	18	393	6	411	13	5,084
TUMOURS:—						
Benign ... ..	...	13	1	13	...	32
Malignant ... ..	...	3	1	3	...	1
MALFORMATIONS ... ..	...	1	...	1	...	4
POISONS:—						
Vegetable ... ..	...	...	...	...	...	1
Animal ... ..	...	15	...	15	...	19
Other Poisons ... ..	...	5	2	5	...	12
PARASITES.						
ANIMAL PARASITES:—						
Protozoa... ..	...	...	...	...	...	...
Trematoda (Flukes) ... ..	...	11	...	11	1	1
Cestoda:—						
Tænia solium ... ..	...	32	...	32	...	35
Tænia saginata	1	276	...	277	...	889
Other Cestodes ... ..	...	...	...	...	...	...
Nematoda:—						
Ascaris ... ..	...	3	...	3	...	85
Tricocephalus dispar ... ..	...	...	...	...	...	...
Trichina ... ..	...	...	...	...	...	...
Dracunculus	5	354	...	359	8	371
Filaria ... ..	...	10	1	10	...	6
Strongylus ... ..	...	...	...	...	...	...
Ankylostomum ... ..	...	90	4	90	...	19
Oxyuris ... ..	...	3	...	3	...	8
Other Nematodes... ..	...	1	...	1	...	...
Insecta:—						
Insects producing myiasis ... ..	...	...	...	...	...	...
Dematophilus penetrans... ..	...	...	...	...	...	17
Other Insects ... ..	...	36	...	36	...	139
Total	743	6,621	256	7,364	797	24,343

TABLE VIII.
SURGICAL OPERATIONS PERFORMED
DURING THE YEAR 1917.

Nature of operation.	Total number.	Cured.	Relieved.	Unrelieved.	Died.
Abortion Clearing Uterus ...	2	2	...	...	...
Abscess	38	37	1	...	...
Acute Osteo-Myelitis	1	...	1	...	...
Adenitis	11	11	...	...	...
Amputation Limbs	20	18	1	...	1
Appendectomy	1	1	...	...	...
Bullet Extraction	1	1	...	...	...
Circumcision	30	30	...	...	...
Cock's Operation	1	...	...	...	1
Curetting Uterus	13	...	13	...	...
Cystotomy, Supra Pubic	3	2	1	...	...
Dental Extraction	2	2	...	...	...
Drainage of Maxillary Antrum	1	...	1	...	...
Ectopic Gestation, Salping- ectomy	1	1	...	...	...
Elephantiasis of Scrotum ...	1	1	...	...	...
Entropion	2	2	...	...	...
Enucleation Eyeball	1	1	...	...	...
Excision Cysts	5	5	...	...	...
„ Tumours	31	31	...	...	...
Exploration of Liver	2	1	...	1	...
Fistula-in-Ano	2	2	...	...	...
Fistula, Recto-Vaginal	1	...	...	1	...
„ Urethral	1	...	...	1	...
Forceps Delivery	1	1	...	...	...
Fractures, Dislocation Shoul- der	5	4	...	...	1
Ganglion	4	4	...	...	...
Gangrene... ..	2	1	1	...	...
Hæorrhoids	2	2	...	...	...
Hernia, Strangulated	2	1	...	...	1
„ Radical Cure	22	22	...	...	...
Hydrocele	15	12	3	...	...
„ Radical Cure	11	11	...	...	...
Hysterectomy	1	1	...	...	...
Iridectomy	3	...	2	1	...
Necrosis	12	9	2	...	1
Orchidectomy	1	1	...	...	...
Ophorectomy for Dermoid Cyst	1	1	...	...	...
Otitis Abscess of Brain ...	1	...	...	...	1
Peastic Operation for Injury	1	1	...	...	...
Pyæmia-Incisions	1	...	...	1	...
Removal, Foreign Body	1	1	...	...	...
„ Ligature	1	1	...	...	...
Resection of Intestine... ..	1	...	...	...	1
Septic Hand	1	1	...	...	...
Skin Grafting	2	2	...	...	...
Teno-Synovitis	3	3	...	...	...
Wound Suture	5	5	...	...	...
Total	270	232	26	5	7

APPENDIX.

THE PARASITOLOGY OF WILD ANIMALS IN NIGERIA, NORTHERN PROVINCES.

The facts recorded below are the result of blood examinations and parasitological work undertaken by myself at Zungeru and Katagum in 1915 and 1916, for the greater part in connection with ordinary sport. Sport in Nigeria is not an easy occupation, and the making of a post mortem examination of an animal obtained by a hard day's shooting is an effort, and the work tends to be scamped.

In looking for blood parasites it seemed desirable to know the common intimate ecto—and endo—parasites of the host, and accordingly worms, ticks, fleas, etc., were looked for as far as possible.

I. MAMMALS.

- (a) *Trypanosomes*.—(N.B.G. *submorsitans* is common at Zungeru and Katagum, and *G. tachinoides* or *G. palpalis* is also present).

Number examined—57.

Animals examined—Roan antelope, 8; greater hartebeest, 2; Senegal hartebeest, 1; reed buck, 6; oribi, 3; duiker, 4; monkey, 2; hare, 6; rock coney, 2; fruit bat, 1; warthog, 8; serval cat, 2; kob, 2; red-fronted gazelle, 7; bush buck, 1; jackal, 1; hyena, 1.

Number showing trypanosomes—2 = 3.51%.

Animals in which trypanosomes were found—Roan, 1; bush buck, 1.

Type of trypanosomes found—*T. vivax* group in each case.

(During the period of the above examination two horses became infected with *T. vivax*, and 44 cattle examined at Zungeru showed trypanosomes in 4 = 9.1%.

The examinations were made by an hour's search over one or two stained slides from each animal).

- (b) *Piroplasma*.—Found in some of the slides, but the average slide obtained during a day's sport is too poor for the demonstration of this parasite, especially as most of the animals are dead before the blood can be obtained from them.

- (c) *Ticks*.—Very numerous on the wild game. Professor Nuttall has kindly identified the following:—

<i>Rhipicephalus sanguineus</i> .	From hare, duiker, gazelle at Zungeru and Katagum.
<i>Rhipicephalus sinus</i>	From warthog, jackal, hyena at Zungeru and Katagum.
<i>Rhipicephalus falcatus</i>	From roan at Zungeru.
<i>Hyalomma ægyptium</i>	From roan and warthog at Zungeru and Katagum.
<i>Hæmaphysalis leachi</i>	From hyena at Katagum.
<i>Amblyoma</i> sp. (nymphs)	From hares at Katagum.

- (d) *Fleas*.—Less common. A jackal shot at Katagum has *Ctenocephalus felis* and *enopsylla pallidus*.

- (e) *Lice*.—A guinea-pig at Zungeru had *Gyropus ovalis* and *Gliriculus gracilis*.

- (f) A fly (*Echestypus sepiaceus*) lives as a parasite amongst the hair of gazelle and duiker at Katagum.
- (g) *Worms*.—Amphistome worms were present in the stomach of nearly every antelope shot. Specimens of amphistomes and various Nematode and Cestode worms (from Monkey, rock coney, reed buck, greater hartebeest, Senegal hartebeest, roan, serval cat, kob, and hyena) were sent to Dr. R. T. Leiper at the London School of Tropical Medicine, but owing to pressure of work, I understand that they have not yet been examined. A cestode scolex was found in the rectus muscle of a monkey.

BIRDS.

- (a) *Blood parasites*.—Number examined—100.

Varieties examined—Guinea-fowl, 25; rock partridge, 18; bush-fowl, 15; green pigeon, 8; sand grouse, 7; wild duck, 7; wild geese, 5; heron, 5; dove, 3; river wader, 3; Niger bird, 1; parrot, 1; hawk, 1; crowned crane, 1.

Parasites found:—

No trypanosomes were found.

Halteridium was present in 26 (=26%), (guinea-fowl, bush-fowl, wild duck, wild geese, river wader, crowned crane). *Leucocytozoon* was found in 21 =21% (guinea-fowl and bush-fowl). *Proteosoma* was present in 4 =4% (rock partridge). *Microfilaria* found in 7 =7% (rock partridge and bush-fowl).

- (b) *Ectoparasites*.—Wild birds were remarkably free from ectoparasites, with the exception of wild duck and geese which had numerous lice.
- (c) *Worms*.—Birds were not examined for worms, except that worms from the intestine of one green pigeon were sent to Dr. Leiper for identification.

REPTILES. *

- (a) *Blood parasites*.—Snakes: 39 were examined. No mammalian form of trypanosome was found. *Hæmogregarines* were present in 14, and *Hæmocystidium* in 2.

Monitors: One monitor examined showed the presence of *Hæmogregarines*.

- (b) *Porocephalus*.—Obtained from the lungs of 5 of the 39 snakes examined.

- (c) *Ticks*.—Professor Nuttall has identified the following:

Aponomma laeve from snakes at Zungeru.

Aponomma exornatum from monitor at Zungeru.

- (d) *Worms*.—Various Nematode and Cestode worms from 15 snakes were sent to Dr. Leiper, but have not yet been identified.

FISH.

Only two Nile perch examined. The blood contained no parasites, and specimens of an *Acanthocephala* and a Nematode worm from the intestine were sent to Dr. Leiper identification.

* Since doing the above work the reporter has examined the blood of two crocodiles shot at Kaduna. The only blood parasites present were *Hæmogregarines*.

(Sgd.) W. B. JOHNSON,

Medical Officer.

